JULY 6, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Process Widens Markets For Porcelain Enameling

So Says Harry T. Marks, president, Ferro Corp., Cleveland. "It's the next step toward a long range goal: A one coat enamel that can be fired at 1250° F." It's a new tool for competing with other low cost surfaces. As a two coat method, it outshines present porcelain enamels. The key: An electroless nickel deposit that replaces the conventional ground coat. . .Page 76.

How McDonald Seeks a Way Out In the Steel Contract Dispute

Labor Peace in Aluminum Is Likely

Exports: Frontier for Marketing

Malleable and Pearlitic Iron Made By Automatic Anneal, Heat Treat

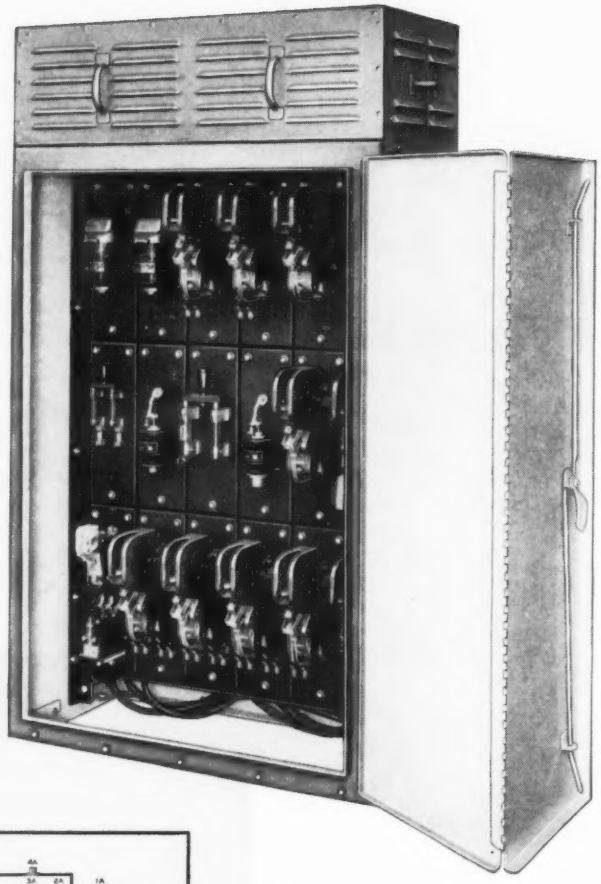
Tungsten Fabrication Gains Ground

Part Stocks O.K., Steel Strike or No

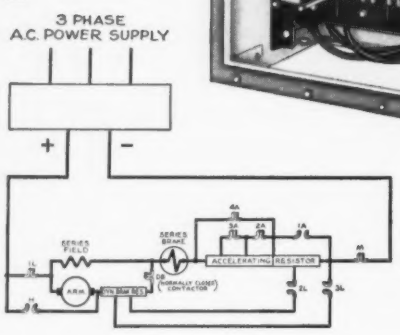
COMPLETE CONTENTS
TURN PAGE

METALWORKING OUTLOOK
PAGE 31

NEW EC&M HOIST CONTROLLER provides DC performance on AC power



- Series Motor
- Series Brake
- Power Limit Stops
- 4 Trolley Collectors



• Now you can have all the advantages of DC crane hoist control on AC cranes. EC&M's new Form HWR controller employs highly efficient, dependable silicon rectifiers to supply DC power to a series-wound hoist motor and its series-wound brake. The circuit used in the new HWR controller is the EC&M Wright dynamic lowering circuit, featuring outstanding simplicity, safety and performance. Positive over-hoisting protection, providing dynamic braking, is offered by Youngstown limit stops.

The silicon rectifiers are compact and are mounted on the top of the controller. They supply power for the hoist and their inherent "blocking" characteristic automatically increases the motor stability for safe lowering of extreme overloads.

This combination of silicon rectifiers and the Wright circuit means less maintenance because load-retarding and load-indicating devices mounted on the trolley are unnecessary. Accurate control of *any* load in lowering is provided. The circuit itself is simple to understand. No crane controller is easier to inspect or maintain. Series brakes and power limit stops are mechanically and electrically safer.

• • •

For refined hook performance on AC powered cranes, get the facts on EC&M's Form HWR control.

THE ELECTRIC CONTROLLER & MFG. CO.
A DIVISION OF THE SQUARE D COMPANY
CLEVELAND 28 • OHIO

2325

This Week in STEEL

The Metalworking Weekly

July 6, 1959 Vol. 145—No. 1

Metalworking Outlook, Page 31

The Editor's Views—Gain a Little . . . Give a Little 37
▶ How McDonald Seeks a Way Out in the Steel Contract Dispute 39
▶ Labor Peace in Aluminum Likely—Look for price hikes 40
Copper Strike Threat Fades—Settlement in steel awaited 43
Strikes Mar Steel Truce—Ore carriers, Republic, J&L hit 43
▶ Exports: Frontier for Marketing—Competition will be tough .. 44
Cross Says Wage-Price Spiral Drives U. S. Plants Abroad 46
Titanium Has Future Air Weapons Use—Survey of 80 firms .. 47
'50s Top '20s on Investment Return—Results of MAPI study .. 51
Construction Builds Equipment Sales—Outlook is brighter 54
Farm Paradox Spells Bigger Markets—Fewer people buy more 55
U. S. Steel Lifts Capacity at Its Vandergrift Plant 71

Technical Outlook, Page 75

▶ At Last: One Coat Porcelain Enameling—Five benefits cited .. 76
Spring Pin Trims Assembly Costs—Betters product stability .. 78
Drawing Method Eliminates Final Trimming Operation 79
Improved Bend Tester Aids Ductility Study—It's faster 80
Ultrasonic Gaging Faster, Keeps Specified Tolerances 81
▶ Tungsten Billets, Shapes Can Be Forged or Machined 82
Progress in Steelmaking—Automatic Line Makes Bars from Coiled Steel Rods—One man controls five operations 84
Diecasting Is One Answer for Small Precision Parts 87
New Method Reduces Beryllium's Brittleness—Space Age aid 88
Test Stand Cuts Manhours, Speeds Pump Testing 90
▶ Malleable and Pearlitic Irons Heat Treated Automatically 92

Market Outlook, Page 109

Complete Index to Market News and Prices 109
▶ Part Stocks O.K., Steel Strike or No—Quarterly survey 111
Steelworks operation chart and district ingot rates 118
Foreign Steel Readily Available in Southwest 115
Scrap Strengthens at Some Points 130
Nonferrous Metals—Copper Hit by Clayton Act 134

▶ Articles listed on cover.

WHERE TO FIND

Metalworking Pulse . . Turn page
Reader Service Center 5
Calendar of Meetings 10
Editorial & Business Staffs 16
Windows of Washington . 48
Mirrors of Motordom 57
The Business Trend 61
Men of Industry 65
Obituaries 68
New Products 95
New Literature 106
Advertising Index 139

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Metalworking Pulse ▶

TURN

Metalworking Pulse

INDUSTRIAL PRODUCTION INDEX

	WEEK ENDED JUNE 27	PREVIOUS WEEK	MONTH AGO	YEAR AGO
(1947-49=100) Based on steel output, electric power output, freight carloadings, auto assemblies	170*	174	169	136

*Preliminary.

Despite the extension of steel industry-USW negotiations, STEEL's industrial production index will continue to decline as summer sets in. The latest figure reflects drops in steel operations and electricity output.

Details on Page 61

U. S. PASSENGER CAR PRODUCTION

	WEEK ENDED JULY 4	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Number of units assembled ..... (Source: Ward's Automotive Reports.)	115,000*	130,001†	125,186	35,273

*Estimated. †Preliminary.

Auto producers cut back only moderately over the July 4 holiday period, dividing shutdowns almost equally between last Friday and today (July 6). They have scheduled this month as another half-million-plus-unit period.

Details on Page 58

NATIONAL STEEL INGOT PRODUCTION

	WEEK ENDED JULY 5	PREVIOUS WEEK	MONTH AGO	YEAR AGO
Net tons (thousands)	2,378*	2,486	2,653	1,376
Index (1947-49=100)	148.0*	154.8	165.2	85.7
Percentage of capacity	84.0*	87.8	93.7	51.0

*Estimated by STEEL; comparative figures reported by AISI.

Mills curtailed output last week to the lowest level since mid-February. Preparations for a shutdown prior to the extension of the strike deadline were not fully canceled, due partly to the approach of vacations and the July 4 holiday.

Details on Page 118

STEEL SCRAP PRICE COMPOSITE

	JULY 1	WEEK AGO	MONTH AGO	YEAR AGO
Based on No. 1 heavy melting grade at Pittsburgh	$36.83	$36.50	$35.00	$35.67

Extension of the steel strike deadline to July 15 released some orders for scrap and lifted embargoes on shipments to some mills. Brisk export demand remains a strong market factor along the Eastern Seaboard.

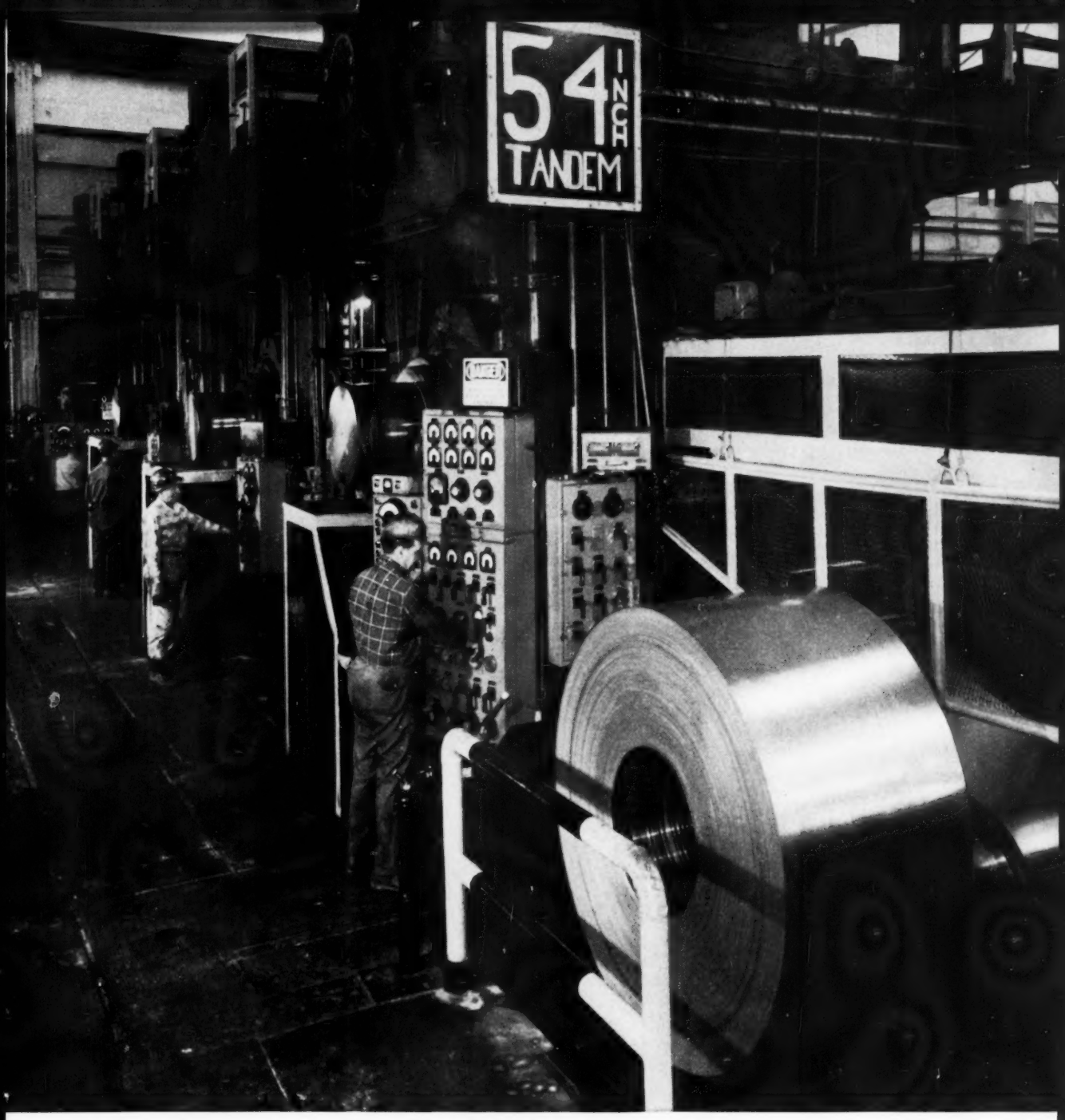
Details on Page 130

FINISHED STEEL PRICE INDEX

	JUNE 30	WEEK AGO	MONTH AGO	YEAR AGO
Based on Bureau of Labor Statistics data (1947-49=100)	186.7	186.7	186.7	181.5

Price uncertainty continues. Most producers rule out any possibility of a cut, maintaining wages can't be raised without a compensating steel price increase.

Details on Page 119



We baby these sheets to do a man's job

Here goes a coil of Bethlehem sheets, sinewed to stand up under rugged duty, as only steel can. To bring sheets to this superlative condition, Bethlehem pampers them like a newborn babe.

From open hearth to shipping room, their progress is checked under the watchful eyes of man and X-ray. Slabs are expertly scarfed. Reheating is controlled by the latest scientific instruments. Rolling and coiling temperatures are carefully controlled.

The finished sheet—whether hot-rolled or sent through the 10 additional steps of cold-rolling—is the result of meticulous care all along the way. You can *always* count on Bethlehem sheets to do a man's job! Put them to the test in your plant.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor:
Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

These standard bearings have special qualities

—*does this mean they cost more?*

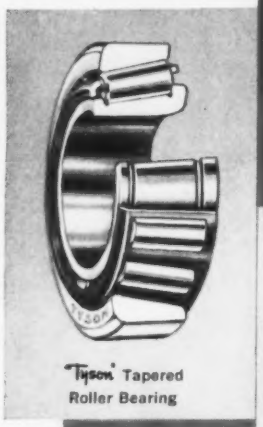
Not necessarily.

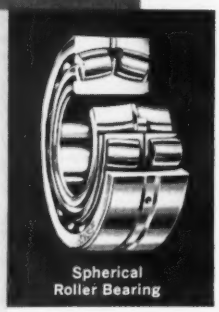
✻Take the spherical roller thrust bearing, for example. SKF bearings of this type can carry unusually heavy loads: either thrust or combined thrust and radial. Unmatched for single bearing performance when high thrusts must be carried at high speed. And they are completely self aligning. Because of these qualities, engineers choose them for heavy-duty applications over large angular contact ball bearings.

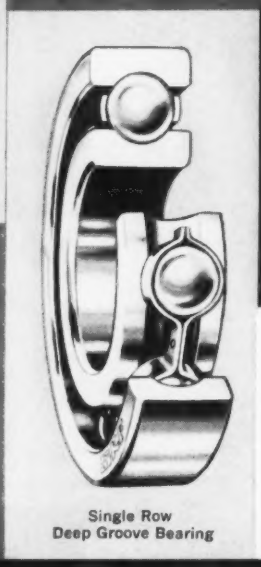
Yet this standard SKF bearing is competitively priced. Furthermore, it is promptly available in 25 sizes ranging from 4.3″ to 14.9″ I.D.

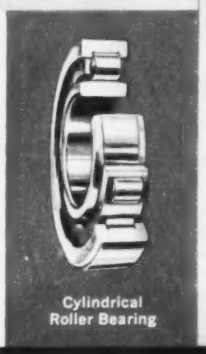
Moderately-priced, high-quality ball and roller bearings are continually rolling off SKF's production lines. So why not get all the facts on those you can use? Just call the nearest of our twenty-five sales offices. 5927

Angular Contact Bearing

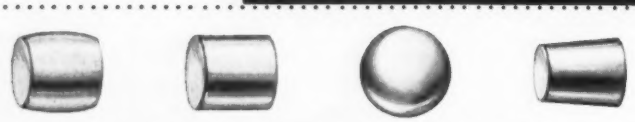

"Tyson" Tapered Roller Bearing


Spherical Roller Bearing


Single Row Deep Groove Bearing


Cylindrical Roller Bearing

✻ Spherical Roller Thrust Bearing



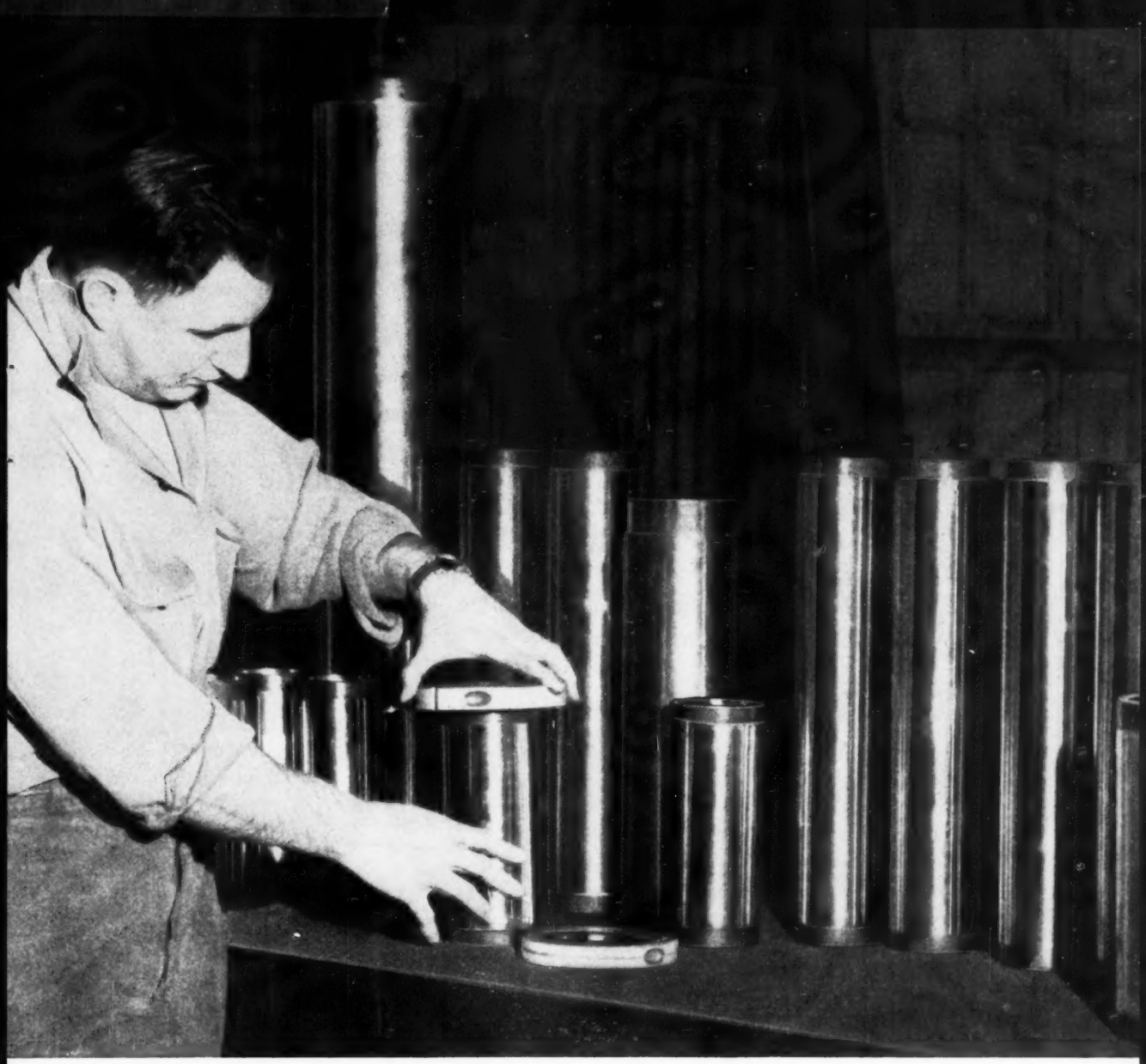
Spherical, Cylindrical, Ball, and "Tyson" Tapered Roller Bearings

EVERY TYPE—EVERY USE

SKF®

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

® REG. U. S. PAT. OFF.



WHO FORGES THE TOUGH ONES? . . . and machines and chrome plates them, too?

In producing the actuator cylinders shown above, we melted the steel, forged and precision machined the cylinders, and then chrome plated the bore to provide a wear-resistant surface. National Forge did the entire job—including final honing to an 8 RMS finish tolerance ±.001. Our extensive chrome plating work, a specialty of the National Forge Company, made it possible to complete the *unusual* requirements in this tough job, from beginning to end, all at a single responsible source.

If you have an unusually tough forging, machining, or finishing job—call National Forge.

NF **NATIONAL FORGE** COMPANY
IRVINE, WARREN COUNTY, PA.

For more information on "the tough ones," and the machinery that makes them "best"—write for Bulletin NFO.

59 01

SMALL RESET COUNTERS

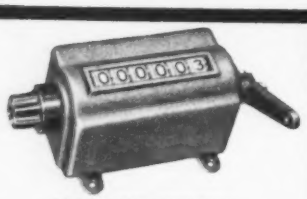
Revolution Counter adds one count for each turn of shaft. Ratchet Counter adds one for each oscillation of lever thru angle of 40-45°. Each type may be furnished as a Combined Counter with totalizer unit. Lock-and-key reset also available.

VARY-TALLY MULTIPLE-UNIT RESET COUNTERS
(Hand-Operated)

Widely used in stock control, traffic control, quality control, inspection, estimating, etc. Fingertip pressure on each key registers each count. Entire horizontal bank resets with one touch of one reset knob. Available in practically any number and arrangement of counters.

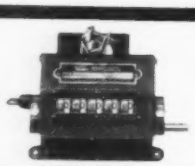
MEDIUM SIZE COUNTERS

Direct Drive (Series 1100) for 1000 counts per minute. Revolution Drive (Series 1101) for 500 counts . . . Ball Bearing shaft mounting for 750 counts. Rotary Ratchet (Series 1106) for 150 counts. Reset or non-reset. Case Dimensions: 4 1/16" long, 1 13/64" high, 1 15/64" wide. 3, 4, 5, 6, 7 or 8 figures.



NEW "VISICOUNTER"

Features greater figure-visibility with dome-shaped window, and increased ruggedness and durability. Includes heavy-duty counting features well-known to users of Veeder-Root Box-Type Counters. Speeds: Ratchet – 500 counts per minute; Geared types – 1000 counts. Dimensions: 4.4" long, 2.8" wide, 2.2" high. Lock and key reset if desired.



HIGH-SPEED PREDETERMINING COUNTERS
Series 1239 (Geared) Series 1378 (Ratchet)

Counters have 2 sets of wheels: Counting wheels and predetermining wheels. Predetermining wheels are set by hand to the exact number of strokes, turns, pieces, etc., desired. When counting wheels read the same as setting of the predetermining wheels, a contact acts to make or break the circuit, operating an alarm or light and stopping machine.

See your Distributor for all the modern "THINGS THAT COUNT"

Before you say "I can't count *that*" . . . give your Veeder-Root Distributor a chance to figure out how you *can* count it . . . whatever unit, motion or impulse it may be. From these standard manual, mechanical and electrical counters he has in stock, he can work out almost any industrial counting problem. So don't count yourself out of savings and profits you may not even know can be obtained. Count on your Veeder-Root Distributor to show you how to get them. *Call him in today.*

Veeder-Root inc.

INCORPORATED/Hartford 2, Connecticut

Hartford, Conn. • Greenville, S. C. • Altoona, Pa. • Chicago • New York
Los Angeles • San Francisco • Montreal. *Offices and Agents in Principal Cities*

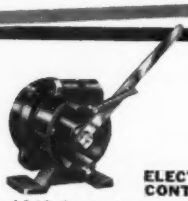
WORM-DRIVEN MEASURING COUNTERS

Geared to indicate in terms of yards, feet, meters, or other units specified. Material passes over friction wheels which may be grooved, knurled, smooth-surfaced or rubber-covered. Forked coupling if desired.

HAND OPERATED COUNTERS

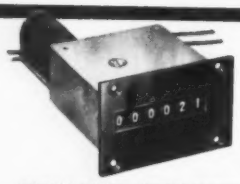
The Hand Tally Counter (Series 1023) adds one for each depression of the thumb lever, and is reset to zero by a single revolution of the reset knob.

The Clutch Speed Counter (Series 1021) counts revolutions of any rotating shaft or member. Its internal clutch operates counter only when rubber tip is pressed against the shaft.



ELECTRICAL CONTACTOR

Series 1048 Contactors assure positive actuation of Veeder-Root Electro-Magnetic Counters. Heavy-duty construction features replaceable contactor arm and replaceable contact screw. Drive: ratchet (lever), or rotary (forked coupling). Dimensions: 3½" long, 3½" high, and 3" wide (approx). Lever, 5" long.



QUICK-RESET HIGH SPEED ELECTRO-MAGNETIC COUNTERS

Series 1591 is rated at speeds up to 3,000 counts per minute. 4 or 6 figures. Manual or electrical reset. Operating voltages: 6, 12, 24, 48, 115, 230 volts DC. Resetting voltages, the same. For AC, suitable external components are added. Electrical reset counter 4.4" long.

GENERAL PURPOSE ELECTRO-MAGNETIC COUNTERS

Series 1205 and 1248, for 24, 115 and 230 volts AC and DC. Base mounted or panel mounted. Knob or lock and key reset. Ruggedly built for speeds up to 1,000 counts per minute. Widely used for remote indication, 6 figures only. Dimensions: Base mount, 3 3/8" long, 2½" high, 1⅞" wide. Panel mount slightly larger.

SMALL RESET ELECTRO-MAGNETIC COUNTERS

Series 1507 includes base and panel-mounted counters for moderate duty not requiring extreme long life or high speed. 24 and 115 volts AC and DC counting coils. 3 or 4 figures. Overall Dimensions: Base mount, 2 3/32" long, 2 1/16" high, 2¼" wide. Panel mount slightly larger.

Do You Fit the Picture?

We were going to title this photo "Editor, Clock, and Unidentified Friend." However, it has a serious meaning so we put aside the whim.

You may be one of ten men who can fill the silhouette next to Editor Walt Campbell. If you've clipped unit production costs through more efficient use of materials, clip and send in the coupon from this column. A Cost Crisis Award Kit will be sent to you by return mail.

Qualification Points

You may enter if you are a full-time employee of a metal producing company or metalworking plant; if you participated in a cost saving project of this type; and if your project was completed after Jan. 1, 1953.

The judges (a panel of STEEL readers) prefer simple, factual presentations so elaborate entries are discouraged. That means you still have time to compete in our second Cost Crisis Awards Competition even though entries must be postmarked not later than July 15.

Simplified Questionnaire

Each kit contains four basic questions: 1. What was the cost problem? 2. What is the solution and how did you find it? 3. Where was cost cutting achieved? 4. What are the "before" and "after" unit costs?

The ten best entries will be declared winners, and the ten companies will be presented Atmos perpetual motion clocks as Production Efficiency Awards.

He Digs the Beat

STEEL's newest baby, the Metalworking Pulse, has many admirers. One such is James W. Frasor, manager of sales, industrial trade products, Northwestern Steel & Wire Co., Sterling, Ill. Says he: "May I compliment you on one of the finest improvements your magazine has come up with in some time.

"I refer to your condensed yellow information sheet, inside the front cover, the Metalworking Pulse. It is extremely good."

Our editors continuously strive to present the maximum news in the easiest usable form for the reader.

With that concern in mind, Associate Editor George Howick next week will start a series of articles forecasting demand for capital equipment. Depressed since 1957, capital equipment is showing a sharp recovery. Here's how George approached the subject.

Confidential Information

The double locked box represents the security precautions which George has put into effect. It contains information he's compiling from some 30 surveys of metalworking. Each survey went to the man best able to forecast his company's plans for capital equipment. For example, one of the surveys checked with 1100 users of capital goods. They were asked to reveal expenditures for nine types of equipment. The list: Material handling, machine tools, presses, heat treating, surface finishing and cleaning, joining and assembly, testing and inspection.

Please send me a COST CRISIS AWARD KIT

Mail this to:
Cost Crisis Editor
STEEL
Penton Bldg.
Cleveland 13, Ohio

PRINT NAME _____

POSITION _____

COMPANY _____

ADDRESS _____

CITY _____

STATE _____

IT'S MACHINE 'TUNE-UP' TIME

How long have your Ex-Cell-O production machines been in continuous operation? Even the most reliable equipment will run faster . . . more accurately and *longer* after a thorough going-over by skilled Ex-Cell-O machine repairmen.

Necessary replacement parts are Ex-Cell-O "original equipment" quality; re-wiring conforms to JIC standards; tables and ways are hand-scraped to their level best; coolant and lubricant systems are restored to full efficiency, spindles are trued, and tooling can easily be up-dated to your specifications.

Call your local Ex-Cell-O Representative, or write direct for details on how older Ex-Cell-O machines can be economically "tuned" to today's production needs.

59-42

XLO EX-CELL-O FOR PRECISION

EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

You've Named It . . .

steelmaking, and foundry equipment.

George also requested that respondents cite their spending for capital goods in the first and second halves of 1958 and 1959. That makes quite a package. Among other things, it will enable George to tell you how much metalworking companies will spend in a lagging area, machine tools.

Of course, information from 30 surveys is a bit unwieldy to present in one story, so George has prepared an introductory outlook article which will run in the July 13 issue, and subsequent issues will carry nine other articles.

If you build, sell, or use capital equipment, watch for this series.

From Chief to Chief

Editors routinely get letters from all over the world and from many eminent people, but here's a prized missive that Irwin Such, STEEL's editor-in-chief received from another chief:

Dear Mr. Such:

Thank you very much for sending me a copy of your editorial ("Inflation: Our Gravest Danger") in the June eighth issue of STEEL magazine. I am highly gratified that you share with me and with so many of our citizens the conviction that we in America must do everything possible to promote an expanding economy on the basis of fiscal integrity and a sound dollar.

With best wishes,

Sincerely,
S/ Dwight Eisenhower
The White House
Washington

What's New?

Here's a choice item about an editor's frustrations. It happened to Austin Brant, associate editor, who writes technical articles and the New Products and Equipment pages.

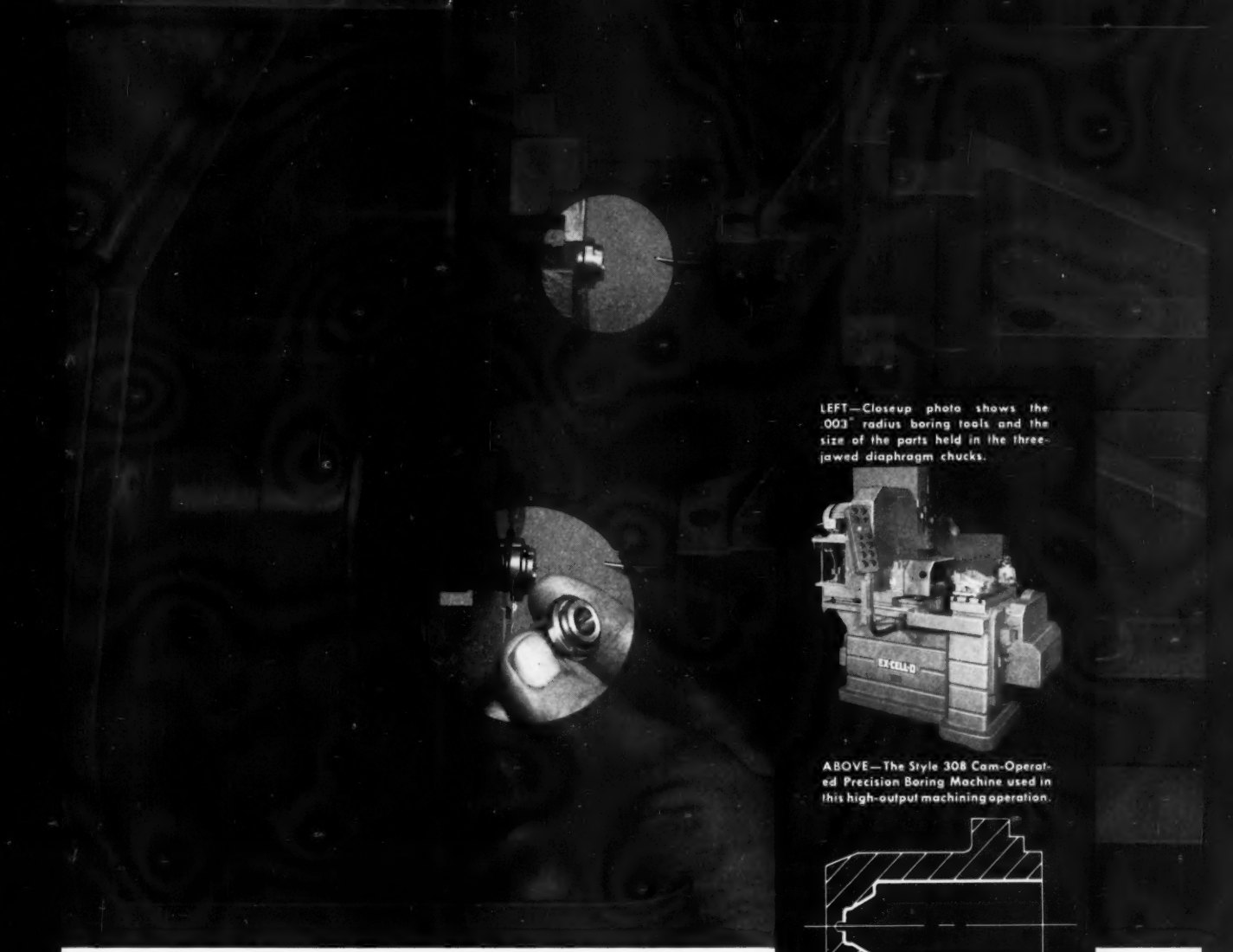
While attending the Sea Horse Institute, (seminars on marine corrosion) at Wrightsville Beach, N. C., Austin chatted with a representative of a large midwest manufacturing company. The topic: Putting a special plating on steel.

Austin saw the plating process as a feature story for STEEL. The news source wanted Austin to wait until the information had been cleared for publication.

They Also Serve . . .

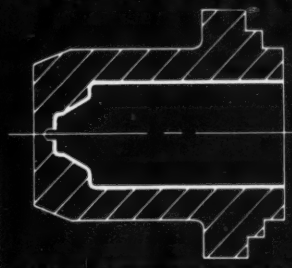
Austin dutifully waited, but no clearance was forthcoming. He called the company. It didn't want us to print the story because it wasn't set up to handle the inquiries which it believed would be generated by a story in STEEL.

P.S. Austin is still hounding the company for the story.



LEFT—Closeup photo shows the .003" radius boring tools and the size of the parts held in the three-jawed diaphragm chucks.

ABOVE—The Style 308 Cam-Operated Precision Boring Machine used in this high-output machining operation.



ABOVE—Cutaway, twice actual size of the part, shows contour of the finished cut. Surface finish is held to 12 RMS.

59-20

BORES AND CONTOURS 184 PARTS PER HOUR

Style 308 Cam-Operated Precision Boring Machine finishes small stainless steel parts to 12 RMS

Speed and precision in continuous, close-tolerance production of contoured parts come easy to this Ex-Cell-O Cam-Operated Precision Boring Machine. Direct cam action makes it possible. Two cams are mounted on a single shaft; one acts directly on the cross slide follower, the other on the table follower. There are no levers. Changing the cams changes the form for the next job—in minutes.

Style 308 (illustrated) and the larger Style 312 hold the parts in one or more spindles, tools are mounted on the cross slide. The machine above uses such a setup to straight-bore and generate the inside contour of 184 parts per hour, two at a time.

If you are anxious to get a similar production process underway quickly and economically, start now by calling your local Ex-Cell-O Representative. Or, if you prefer, write direct.

EX-CELL-O FOR PRECISION XLO

EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN
Machinery Division

EX-CELL-O PRECISION PRODUCTS INCLUDE: MACHINE TOOLS • GRINDING AND BORING SPINDLES • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • TORQUE ACTUATORS • THREAD AND GROOVE GAGES • GRANITE SURFACE PLATES • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT.

Republic's CENTURY 100 SERIES of

High Strength, Stress Relieved, Cold Finished Steel Bars

What Is The CENTURY SERIES? A family of five grades of cold finished, specially processed, stress relieved bars having a minium yield strength of 100,000 psi. Available from Republic in C-1144, C-1141, C-1151, C-1050, C-1045.

Why a CENTURY SERIES? To meet the needs of steel parts producers requiring high strength with varying degrees of machinability. The CENTURY SERIES assures dimensional stability with excellent machinability, provides high mechanical properties in a range of chemistries.

Republic's overall policy has always been to suggest the least expensive grade of steel that will adequately meet the mechanical requirements of the application and the degree of machinability desired.

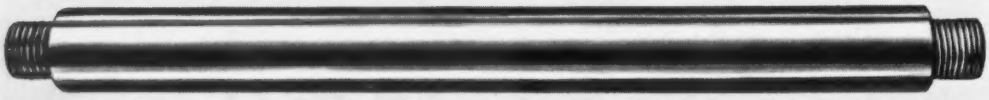
C-1144, for example, would be the proper choice for a part requiring high strength combined with maximum machinability. However, it may not be the best or most economical selection for parts on which machinability is not of prime importance.

Republic's CENTURY SERIES makes it possible to achieve considerable savings by selecting the grade best suited to a specific requirement. Where maximum machinability is not required a lower sulphur grade, such as C-1141 or C-1151, can be considered. If machinability is a minor factor, C-1050 or C-1045 may be considered. As sulphur decreases, toughness and resistance to shock increase. Therefore, it is frequently possible to obtain a better strength/toughness ratio at lower cost by using one of the lower sulphur steels as indicated on the chart.

GRADE	ANALYSIS EXTRA	BEST COMBINATION OF STRENGTH & TOUGHNESS	MACHINABILITY
C-1144	$1.35		
C-1141	1.10		
C-1151	.70		
C-1050 & C-1045	.15		

Which Grade Is Best For Your Production? Republic offers the services of expert metallurgists—field, mill, and laboratory—and machining specialists to work directly with your personnel in selection, application, and processing of the right grade for your particular application.

CENTURY SERIES C-1144 Distributor Shaft



CENTURY SERIES C-1141 Hoist Support Shaft

CENTURY SERIES C-1151 Electric Motor Shaft

CENTURY SERIES C-1050 Axle

CENTURY SERIES C-1045 Shaft

Want More Facts? This FREE BOOK provides the basic facts you need to determine where Republic's CENTURY SERIES may help you save time and money in the production of steel parts. Mail the coupon for your copy.

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and rugged

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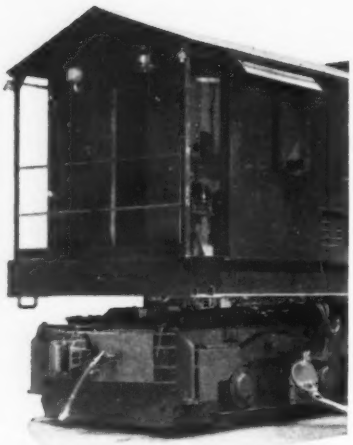
CARS



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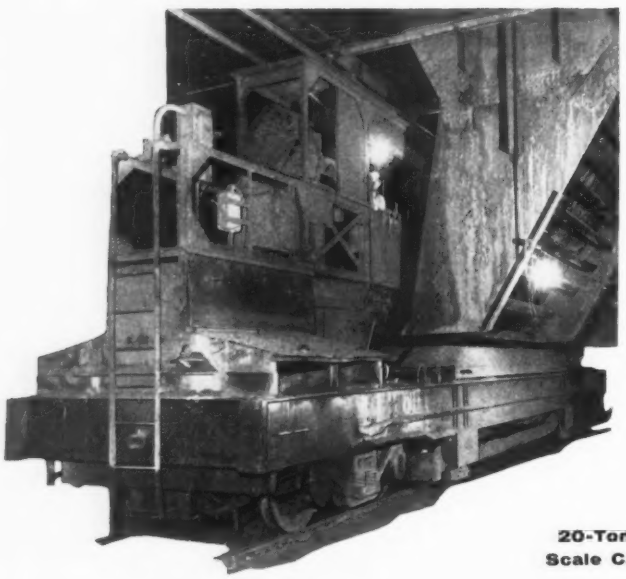
performance expectations



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1140 IVANHOE ROAD
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CALENDAR
OF MEETINGS

July 13-15, Truck-Trailer Manufacturers Association: Semiannual meeting, Homestead Hotel, Hot Springs, Va. Association's address: 710 Albee Bldg., Washington 5, D. C. Executive manager: John B. Hulse.

July 29-Aug. 1, National Tool & Die Manufacturers Association: Summer board meeting, Grand Hotel, Mackinac Island, Mich. Association's address: 907 Public Square Bldg., Cleveland, Ohio. Executive vice president: George S. Eaton.

Aug. 10-13, Society of Automotive Engineers: National west coast meeting, Hotel Georgia, Vancouver, B. C. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Aug. 18-21, Western Electronic Show and Convention: Cow Palace, San Francisco. Information: WESCON, 1435 S. La Cienega Blvd., Los Angeles 35, Calif.

Aug. 19-20, National Screw Machine Products Association: Sales conference, Wade Park Manor Hotel, Cleveland. Association's address: 2860 E. 130th St., Cleveland 20, Ohio. Executive vice president: Orrin B. Werntz.

Aug. 31-Sept. 2, Metallurgical Society of AIME: Institute of Metals Division's conference on semiconductors, Statler-Hilton Hotel, Boston. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: R. W. Shearman.

Sept. 13-17, Pressed Metal Institute: Annual meeting, Stanley Hotel, Estes Park, Colo. Institute's address: 3673 Lee Rd., Cleveland 20, Ohio. Managing director: Harold A. Daschner.

Sept. 13-18, American Chemical Society: Fall meeting, Convention Hall, Atlantic City, N. J. Society's address: 1155 16th St. N.W., Washington 6, D. C. Executive secretary: Alden H. Emery.

Sept. 14-17, Society of Automotive Engineers: National farm, construction, and industrial machinery meeting, production forum, and display, Milwaukee Auditorium, Milwaukee. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

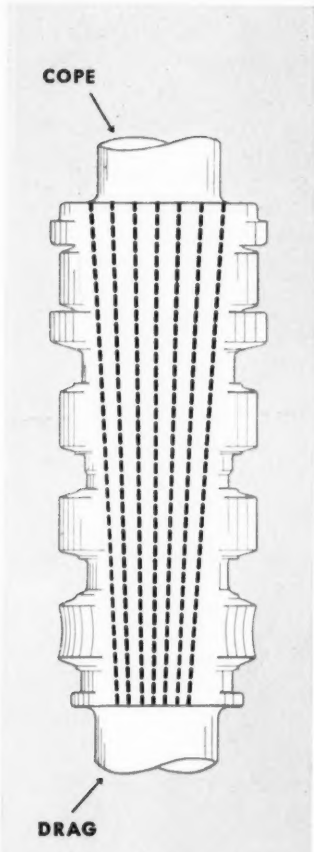
Sept. 16-17, American Die Casting Institute: Annual meeting, Edgewater Beach Hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N. Y. Secretary: David Laine.

TIPS FROM A ROLL MAKER'S NOTEBOOK

MACKINTOSH-HEMPHILL DIVISION, E. W. BLISS COMPANY, Pittsburgh 3, Pennsylvania

Cast mill rolls • Johnston cinder pots • rotary tube straighteners • end-thrust bearings • heavy-duty lathes • steel and special alloy castings

With rolls, it pays to know which end is "up"



Cast steel structural mill roll shows good pass location to promote proper directional solidification.

There's a very good reason why every roll shipped by Mack-Hemp carries the word "DRAG" engraved on one wabbler. With all cast rolls, maximum strength and depth of sound metal tend to occur toward the *drag* end of the roll—the end at the bottom of the mold when the roll is being poured. This is because of the normal manner in which the "lines of solidification" form as the molten metal cools and solidifies. Also the pressure from the weight of the metal above helps increase the density of the metal in the drag end of the roll.

As you can see from the diagram at the left, the solidification lines angle gently outward as they rise toward the top or "cope" neck of the roll, forming a cone-shaped pattern. In general, these lines of solidification mark the boundary of the dense, homogeneous metal. As a result, there is more good metal in and near the drag end than at the cope end. To assist the roll user in quickly identifying the "bottom" end of his rolls, Mack-Hemp brands the drag wabbler of every roll produced in its foundries.

Locate the deepest passes in the DRAG end—Roll designers making drawings for blooming, rail and structural mill rolls should try to locate the deepest passes in the driven end of the roll, as illustrated. Directional solidification from drag to cope is then more easily accomplished and a sounder casting results.

We don't mean to imply that deep passes cannot be located at the cope end of the roll—in some instances, the overall mill layout, flow to the next mill, etc. may make it necessary to have the deepest pass in the cope end. When possible, however, this should be avoided since a deep pass in the cope end of the roll will restrict proper feeding of the lower portion of the roll.

Another factor—For maximum roll life, roll blueprints should call for the deepest passes at the driven end of the roll body. If you have a special reason why they must be located elsewhere, note it on the drawing; otherwise any roll maker worth his salt will ask you about it.

An important legend... for maximum roll life, the drag wabbler should be driven.

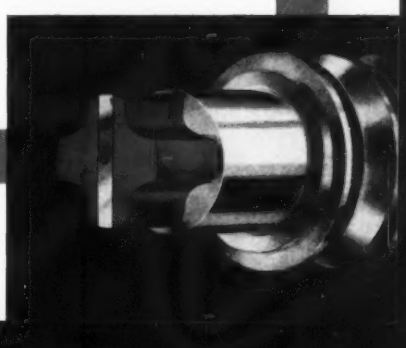
Another good rule to follow is to check with Mack-Hemp on any problem of roll selection or application. In a century and a quarter of making mill rolls, we have run across just about every conceivable situation involving the use of rolls. Our advice is yours for the asking. Feel free to telephone or write us at any time.

MACKINTOSH-HEMPHILL

You get more tonnage from the rolls with the Striped Red Wabblers

Division of E. W. BLISS COMPANY

Presses, Rolling Mills, Special Machinery



In the vacuum-pourer shown above, the melt is poured into a low-pressure atmosphere in which the molten stream is dispersed—releasing undesirable gases and other substances.

Special alloys, low hydrogen content steels, finished products—available on short notice from Standard

Even in the face of today's extremely critical requirements in metallurgy, Standard Steel Works has maintained its great reputation for quality and service.

With our electric furnace—and the new vacuum-pouring degasser recently placed in operation—we at Standard have facilities in keeping with industry's demands for steel in all applications.

Samples of vacuum-poured steel are tested for gas content in the analytical laboratory apparatus shown above.

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Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes

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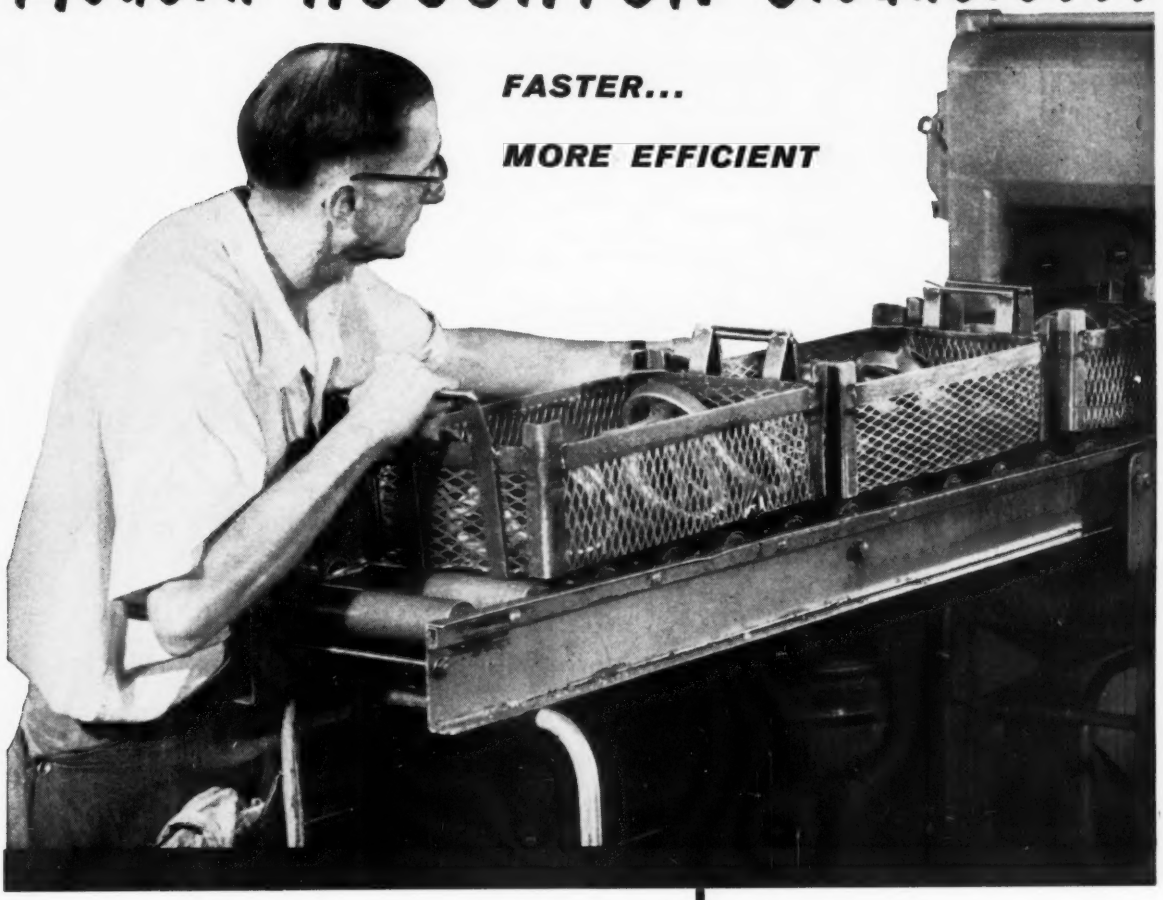
Modern HOUGHTON Cleaners...



HOUGHTO-CLEAN COLD CLEANERS operate in this power washer, cleaning bearing races. Cleaning is fast, economical and efficient, removing cutting oils and shop soil and imparting a rust preventive film at the same time.

SIZABLE SAVINGS—Houghto-Clean room temperature Cleaners eliminate the need for heat and costly heating equipment. They operate without foam or fumes; shops are cooler, parts handle easier.

COMPLETE LINE OF CLEANERS—Houghton Modern Chemistry is producing a full line of cleaners to speed and simplify industrial metal cleaning of all types. Write for a copy of "Metal Cleaning Compounds" booklet. E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

Houghto-Clean "Cold" Cleaners save costs—are easy to use.

- highly effective cleaning
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- greater plant safety

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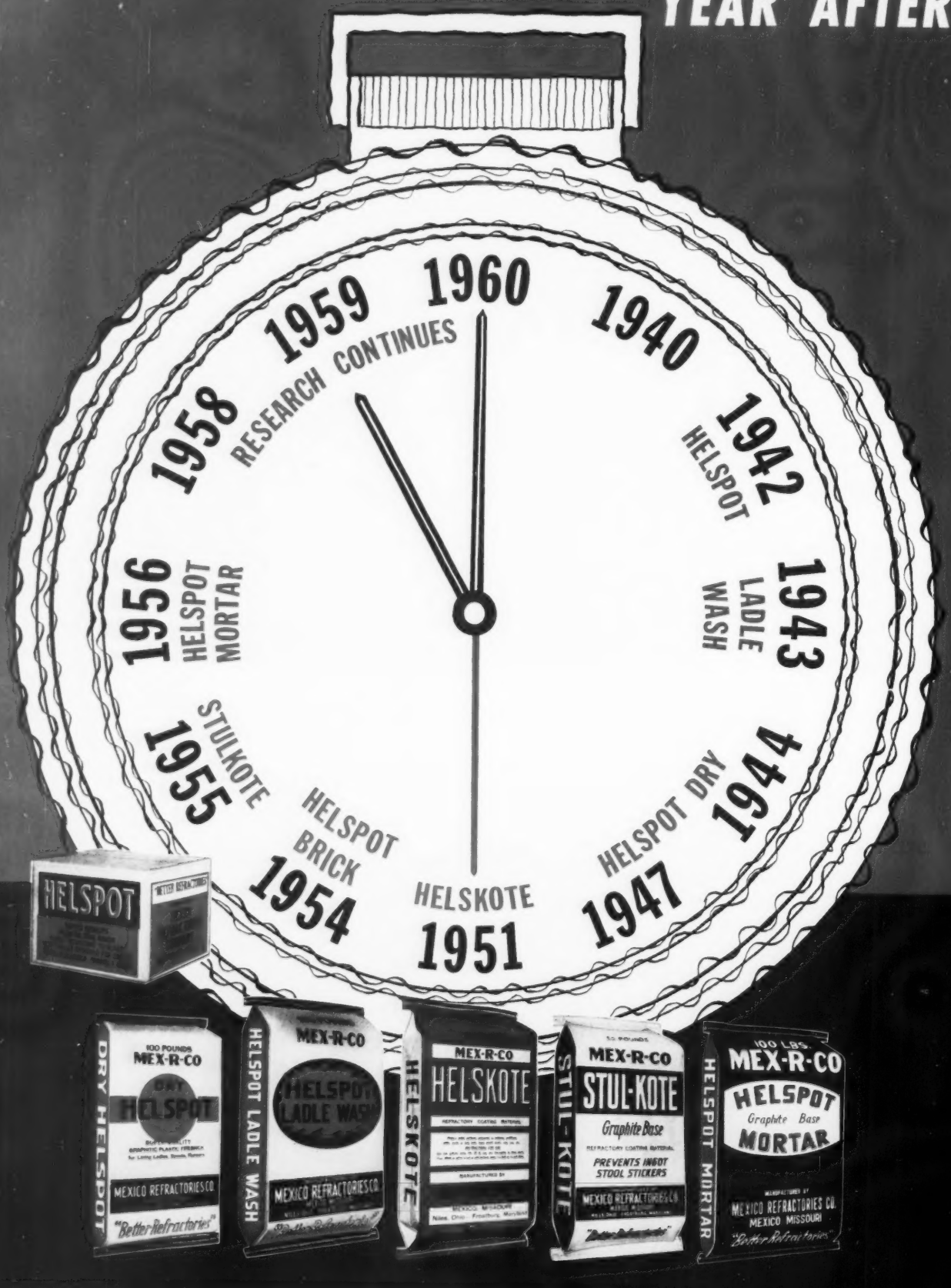
Service and

YEAR AFTER



Time Proven YEAR...

MEX-R-CO Graphite-base Products are recognized for their consistent and outstanding quality of DEPENDABILITY wherever molten metal or slag is being conveyed or contained.

In Service HELSPOT Will . . .

. . . ***Minimize Metal Contamination***

Inclusions are practically eliminated, resulting in cleaner metal, fewer rejections

. . . ***Facilitate Slag Removal***

With less skull formation and adhesion longer ladle-life naturally results

. . . ***Resist Thermal Shock***

Super-Duty clay and graphite blend produces unusually high spalling resistance

. . . ***Provide Free-flow Surface***

HELSPOT is non-wetting; molten metal flows without penetrating or sticking

In Service HELSKOTE Will . . .

. . . ***Reduce Stickers by 90%***

Save on stripping time; Put molds in use quicker; More ingots poured

. . . ***Increase Stool Life***

Result will be greatly reduced stool cost per ton of ingots poured

. . . ***Cut Buggy Maintenance***

Broken wheels, axles and springs, and track repair costs will be reduced

. . . ***Reduce Busy-Crane Time***

Faster ingot delivery to soaking pit; Quicker release of molds for re-use

NOW LET'S HAVE A LOOK AT COSTS

The "price per ton" of a graphite-base product should not be the sole criterion for determining its value. Rather, the value of the product should be gauged by its effect upon the over-all costs of production per unit of output.

Basic costs—transportation, handling, brick layer's time, etc.—are the same for an untried, unproven or inferior product as for one of proven and dependable year-in, year-out performance.

Weighing these factors (plus output loss due to more frequent shutdowns for untimely repair or rebuilding), it becomes evident that graphite products of lowest cost DO prove to be the most expensive in the over-all cost analysis.

That is why industry has developed a healthy appetite for graphite-base products with proven service performance, that do cut costs of production, that do hold down inventory costs.

The evidence is conclusive that the over-all costs of containing and/or conveying molten metal CAN be controlled by the utilization of MEX-R-CO Graphite-base Products.

MEXICO REFRACTORIES COMPANY

Division of KAISER ALUMINUM & CHEMICAL SALES, INC.

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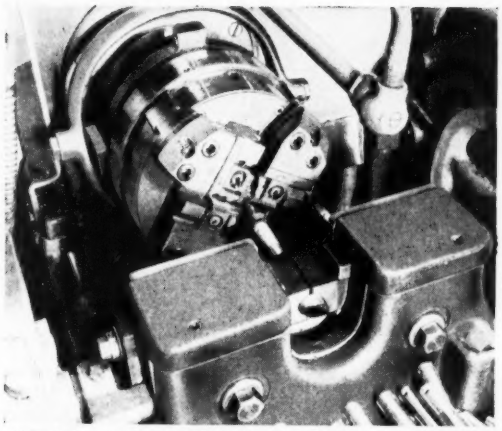

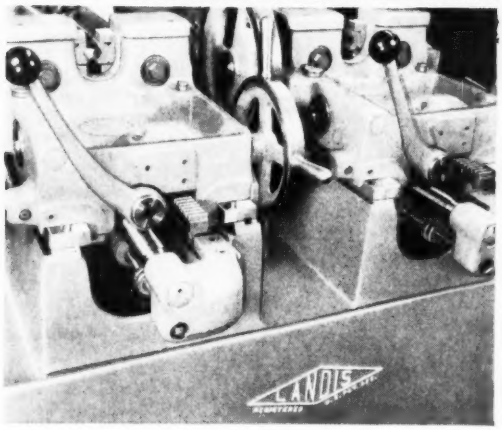

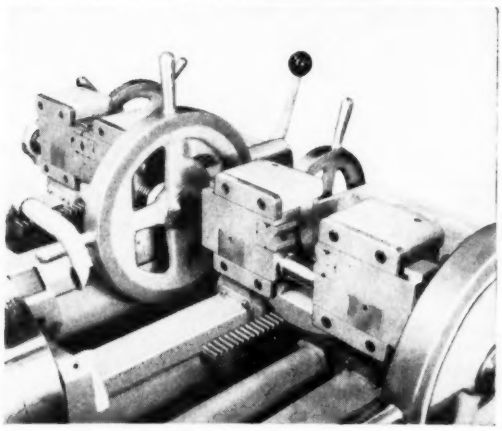

. . . are built in a wide variety of models for commercial, heavy duty, and precision threading from 3/16" to 2½" in diameter.

Single or double-spindle models are available in varying bed lengths, with or without lead screw, using either of two die head styles, according to individual requirements. The die heads use LANDIS Tangential Chasers, which may be reground for 80% of their original length. Adaptation for oversize capacity and special jobs is easily made through auxiliary equipment.

PRECISION

Hardened and Ground LANCO Die Heads combined with Lead Screw Feed enable threading to Class 4 and Class 7 tolerances. The fundamental design and specially selected and hardened materials of the die head provide the maximum rigidity required for this class work.

HEAVY-DUTY

Lead Screw Feed and rugged LANCO Heat Treated Die Heads enable the unusually heavy cuts required for producing Acme threads. Despite the heavy rate of metal removal, workpiece slippage is prevented by vise gripping power intensified by a "hammer blow" operating handwheel.

VERSATILITY

Each LANDMACO Threading Machine cuts a wide range of thread diameters—for example, the 12C LANDMACO has a standard threading range from ⅛" to 1½" in diameter, with oversize capacity to 3¼" for short thread lengths. Standard carriage vises enable the gripping of diameters larger than the machine's capacity, and special vises may be furnished. Tooling is available for Tapping, Turning, Grooving, Forming, and Facing operations.

For more information, send specifications and ask for Bulletin H-76.

465

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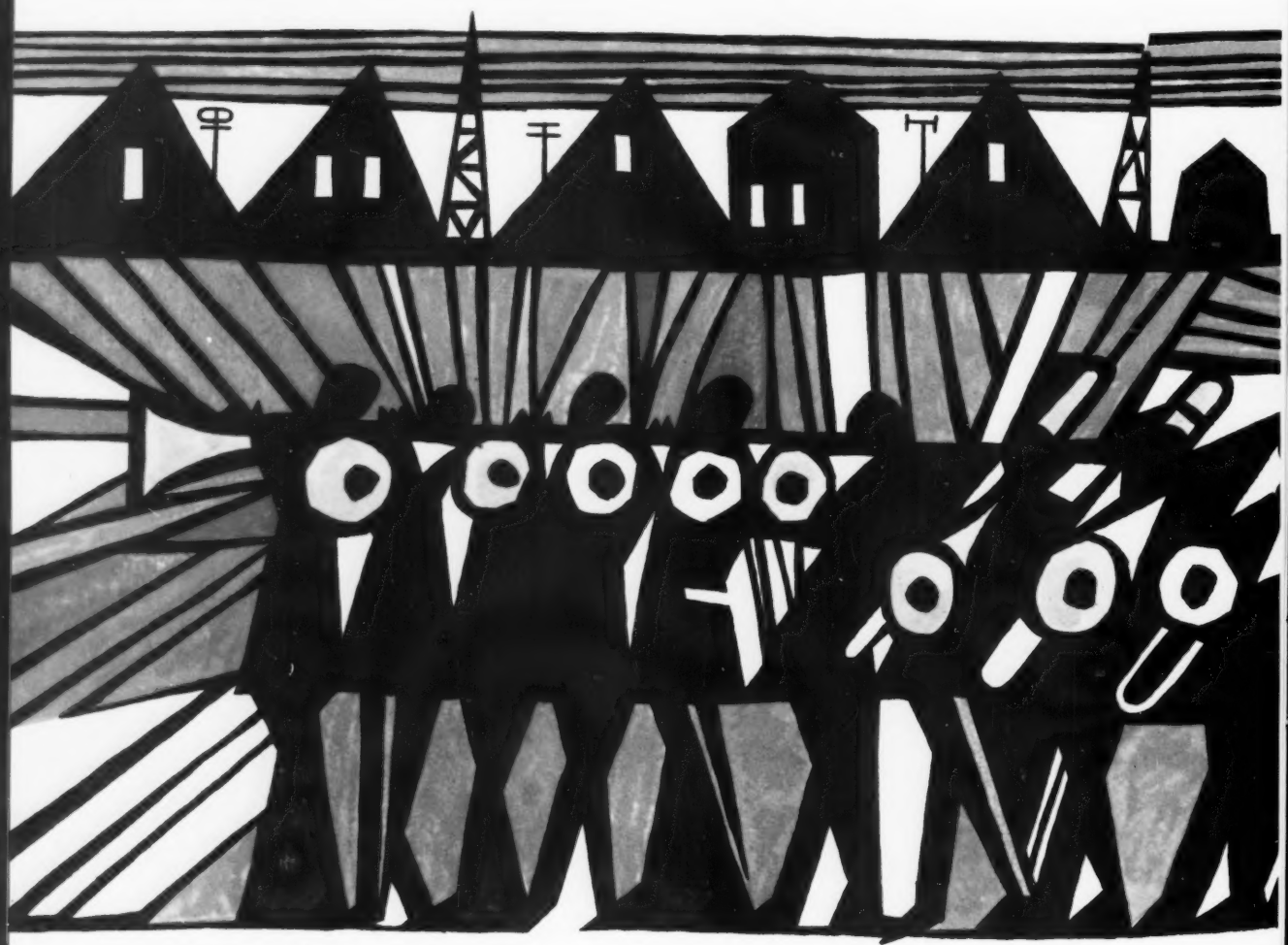
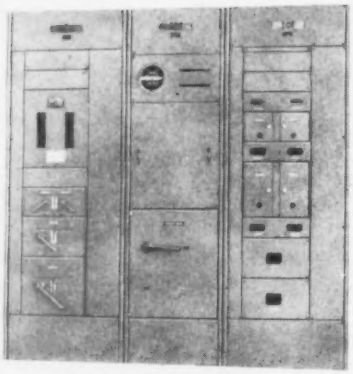
COPPER MAKES BEAUTIFUL MUSIC

round tones, deep tones, sharp tones, flat tones.
copper makes brass, bells and bugles, trumpets and trombones.
copper makes bronze for a beethoven bust.
and copper makes wire. wire, wire, printed wire.
wire for radio, wire for stereo. wire for telephony and tv.
music. modern music. copper's the conductor.
without copper . . . how still the air.

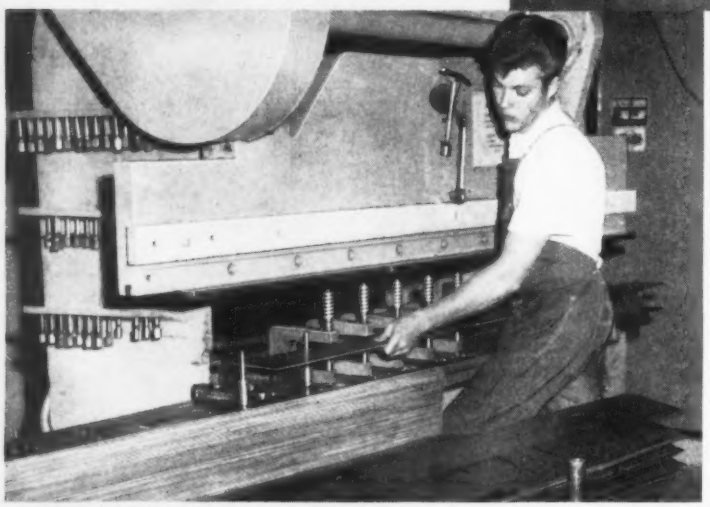


♀ For information about Copper and Copper Alloys, write Copper & Brass Research Association, 420 Lexington Avenue, New York 17, N. Y.

Built better by "BULLDOG"... using THE COST-CUTTING **STRIPPIT** SYSTEM



Power switchboard by BULLDOG ELECTRIC. Fully interchangeable parts.



PRESS SETUPS OFF THE SHELF!

BULLDOG ELECTRIC stores Strippit drilled templates on conveniently located shelves, Strippit Hole Punching Units and Tooling on this mobile rack. Pilot pins on units slip-fit into template pilot holes for exact positioning, quick mounting outside press by bench man. All units reusable over and over in unlimited patterns.

NO LOSS OF PRESS TIME!

Strippit setups cut between-run time to a minimum—just remove last set-up from press bed, insert new one and start run. Both short and long runs are profitable with Strippit setups. Here, parts for BULLDOG switchboards are being perforated accurately and rapidly. In other operations, Strippit Notching Units provide equal flexibility.

H. J. LOCKWOOD, Plant Superintendent, **BULLDOG ELECTRIC PRODUCTS** of Los Angeles writes:

"In building BULLDOG Switchboards to perfect uniformity for full interchangeability of parts, I have centered our production methods around Strippit tooling. All the perforating and notching operations are performed without fixed dies. Work flows smoothly through the machines without tieups. In no other way could we produce this quality product so efficiently."

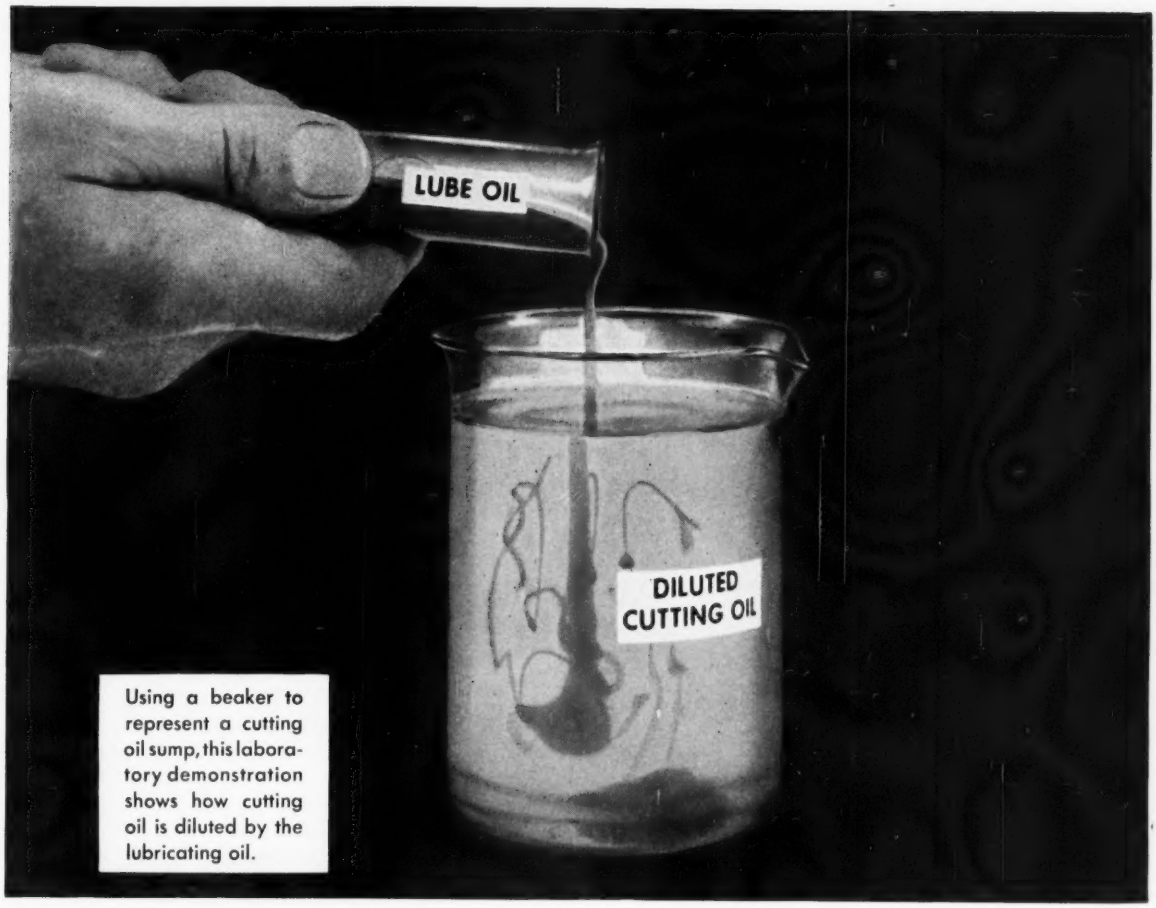
A UNIT OF HOUDAILLE INDUSTRIES INC

WRITE TODAY for details on the savings you could be enjoying with Strippit setups on your presses!

WALES STRIPPIT INC.

210 Buell Road, Akron, New York

Manufactured in Canada by: Strippit Tool & Machine Company, Brampton, Ont.



Using a beaker to represent a cutting oil sump, this laboratory demonstration shows how cutting oil is diluted by the lubricating oil.

Diluted cutting oil can cut output 33%

No matter how careful your lubricating techniques, you still can't stop lube oil from leaking into the cutting oil sump on 70% of automatic screw machines. As cutting oil is diluted, it loses strength—ingredients that make it efficient become less and less effective. The natural consequence is shortened tool life, more downtime and a higher percentage of rejects.

Texaco Cleartex can end this problem forever. All you have to do is use Cleartex for both cutting *and* lubrication . . . and watch your production rise. The exceptional chemical stability and load-carrying ability of the Cleartex series make them equally suitable for use as cutting oils, lubricants and hydraulic fluids. (70% of all automatic screw machines can benefit from the "Cleartex Cure!")

TAKE THE CLEARTEX CURE SOON!

Write today for your copy of Texaco's new booklet—"Cleartex in Automatic Screw Machines." This new illustrated guide will fill you in on the details, show you where you may be losing profits and how to avoid it . . . Or contact your local Texaco Lubrication Engineer soon for an authoritative survey of your automatics. Just call the nearest of more than 2,300 Texaco Distributing Plants, or write to Texaco Inc., 135 East 42nd Street, New York 17, New York. Dept. S-FM-12.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

at Johnson's Machine Company

. . . with the help of the Ætna Life's Business Planning Department

When Fred Johnson died last year his thriving machine shop didn't have to go out of business . . . experienced no down time . . . because Mr. Johnson was a progressive and foresighted man.

With the help of his Ætna Life representative, attorney and accountant, he set up a plan which gave his wife in cash the full going concern value of the business. This same plan provided for a smooth transition of the ownership to two of his key employees – avoided financial chaos in the business and disaster to his own family.

If you own or operate any kind of business, it will pay you to investigate the vital need for a business continuation plan – and no one is better equipped to serve your interests than the Business Planning Department of your local Ætna Life General Agency.

ÆTNA LIFE
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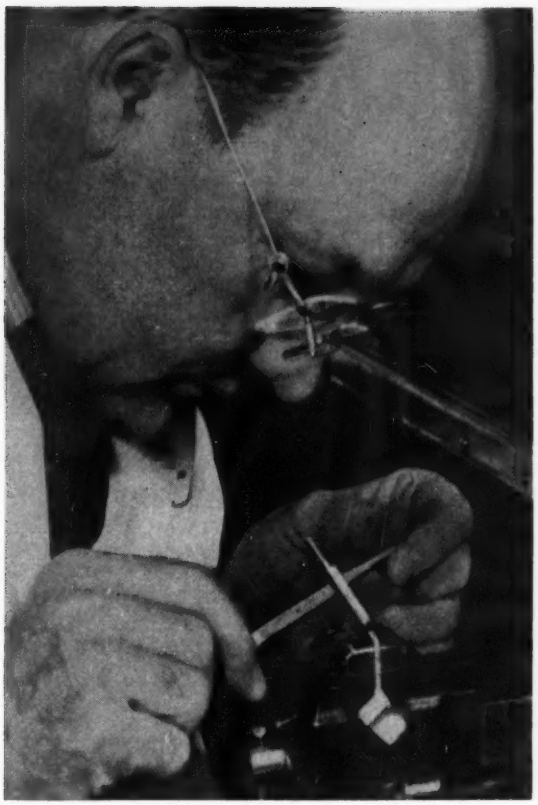

Cut filing costs with files that increase filing skill

Time and labor—not the file—are the largest part of filing costs. But the file directly affects the time it takes to finish the job. The file is a hand tool—in effect, an extension of the man. If it reduces his skill, the work suffers and costs go up. If the file matches or increases his skill, he becomes more productive and costs go down. That's why more users choose *Nicholson, Black Diamond and X.F.* (Extra Fine) *Swiss Pattern files than any other. That's why file buyers and users* prefer *these brands over any others.* *X.F. Swiss Pattern Half Round file, one of more than 6000 Nicholson-made files that can cut your filing costs. We design our files to bring out the man's highest skill. He does his best work when he uses them. They are the most economical files you can buy. Your Industrial Distributor has a full selection. Call him for the Nicholson or Black Diamond file for your purpose.*

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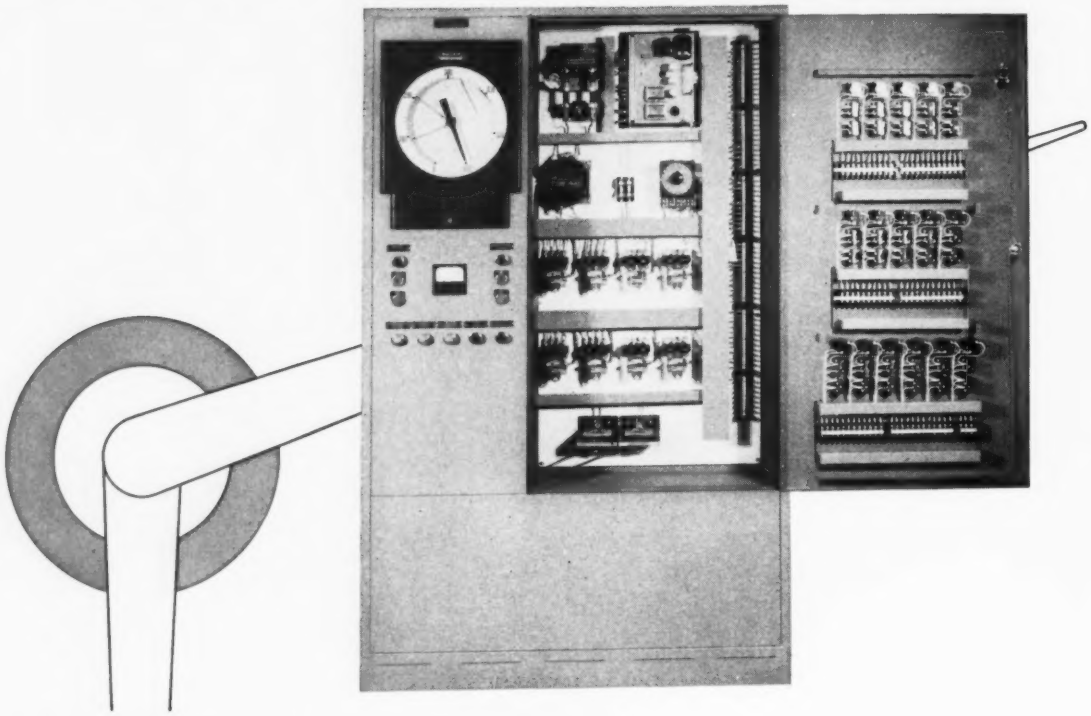
NICHOLSON FILE COMPANY, PROVIDENCE 1, RHODE ISLAND

Files and Rotary Burs — Hacksaw and Bandsaw Blades
Ground Flat Stock — Industrial Hammers

✳ Industrial Distributors provide the finest goods and services in the least possible time. Our products are sold exclusively through them.

FINISHING SYSTEMS...



ENGINEERED for CONTROL, DEPENDABILITY, QUALITY and SAFETY!

A Modern Finish Baking Oven is not just an indiscriminate assembly of insulated panels, heating units, ducts, fans, blowers, motors, etc.

The Mahon Oven Control Panel, illustrated above, was engineered and built by Mahon for one Mahon Finish Baking Oven which was specially designed to meet the exacting requirements of a particular manufacturer. This is just one example of how each component is thoroughly engineered into Units of Mahon Finishing Equipment to insure quality construction throughout, functional dependability, positive control and maximum safety in operation.

If you are considering a new finishing system, or any unit of finishing or processing equipment, you will want to discuss your requirements with Mahon engineers . . . you'll find them better qualified to advise you on possible production layouts, and better qualified to do the initial planning and engineering which plays such an important role in the ultimate operating efficiency of specially designed equipment of this type.

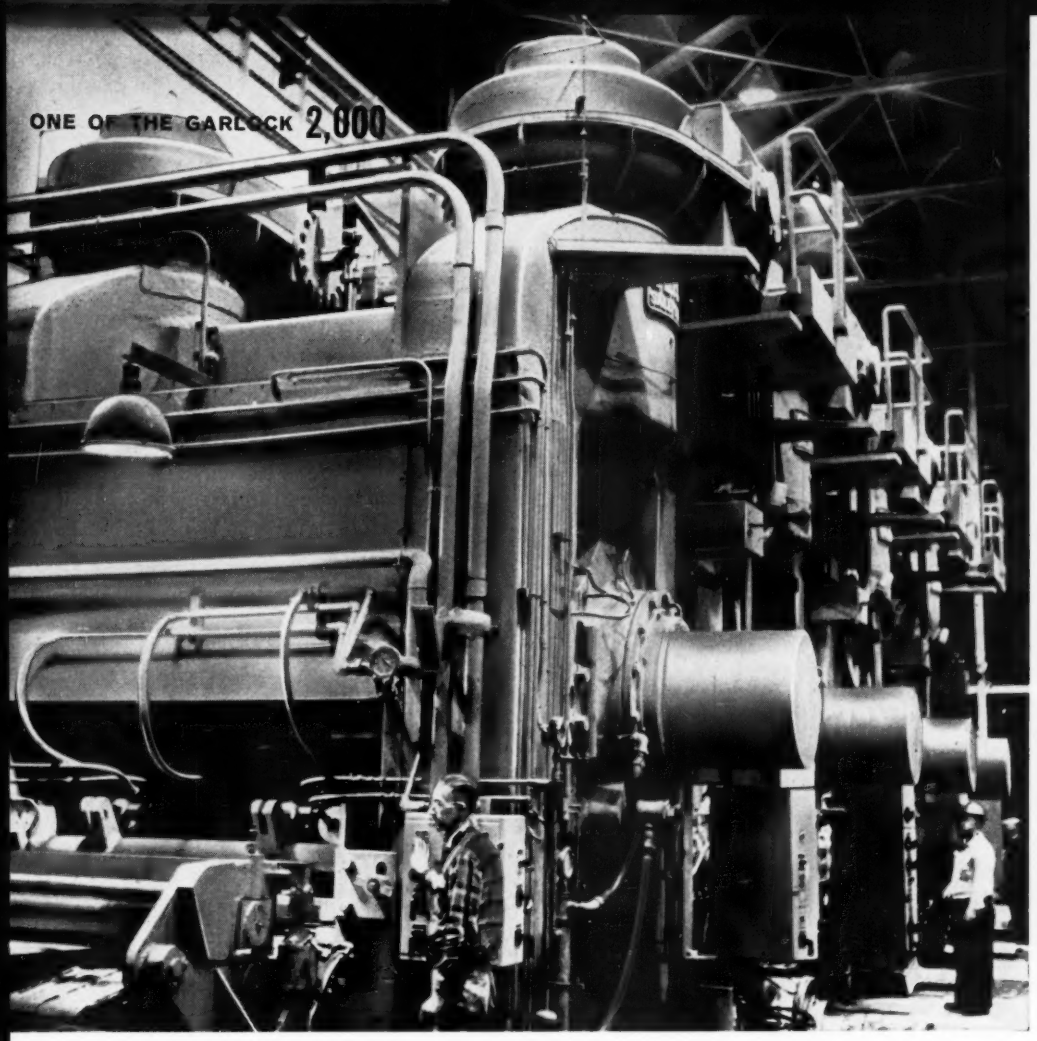
See Sweet's Plant Engineering File for Information, or Write for Catalogue A-659

THE R. C. MAHON COMPANY • Detroit 34, Michigan

SALES-ENGINEERING OFFICES in DETROIT, NEW YORK and CHICAGO

. . . the EXPERIENCE that goes into the PLANNING and ENGINEERING of MAHON EQUIPMENT is the item of GREATEST VALUE to YOU!

MAHON



Model 64 assembled KLOZURE for back-up and work rolls. Designed for large shafts, severe service.

Model 82 banded KLOZURE for back-up and work rolls, normal to high speeds. Comes as large as 44" diameter.

Model 21 or 23 Split-KLOZURE for installation without disassembly of equipment. Medium-speed service.

Model 142 face type KLOZURE for mill rolls. Designed to seal surfaces perpendicular to shaft.

Model 53 assembled KLOZURE for table rolls, normal to high speeds. Withstands temperatures to 250° F.

On all mills—Bearings are fully protected by Garlock KLOZURE* Oil Seals

Everywhere in steel—on hot and cold strip mills, blooming and structural mills, rolling mills—Garlock KLOZURE Oil Seals prevent leakage of vital bearing lubrication. And, they further prevent damage to the bearings by sealing out dirt, spray, and other foreign matter.

Model 142, for example, keeps water splash and scale out of bearings at the shoulder of a mill roll. Models 64 and 82 are ideal for protecting bearings on back-up and work rolls; Model 53 is recommended for table rolls; and, where equipment can't be dismantled easily, Model 21 or 23 split-KLOZURES are the choice.

All KLOZURES are oil and grease resistant . . . impervious to water, mild acids, alkalies . . . non-abrasive . . . withstand temperatures from −40° F. to +250° F. For extreme conditions, Garlock furnishes sealing elements resistant to practically any fluid, and serviceable as high as +500° F.

KLOZURE Oil Seals are another part of the Garlock 2,000 . . . two thousand different styles of packings, gaskets, and seals for every need. Call your local Garlock representative, or write for Catalog 20.

THE GARLOCK PACKING COMPANY, Palmyra, N. Y.

For Prompt Service, contact one of our 30 sales offices and warehouses throughout the U.S. and Canada.

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Packings, Gaskets, Oil Seals, Mechanical Seals, Molded and Extruded Rubber, Plastic Products

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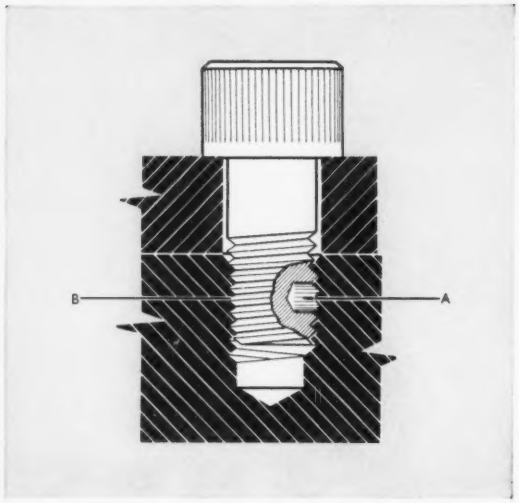
SPS RELIABILITY / *A dynamic standard of predictable performance*

Why UNBRAKO socket screws with Nylok* won't work loose

Self-locking UNBRAKO socket screws, in a full range of standard types and sizes, are stocked by your authorized SPS distributor. Permanently installed locking pellets are serviceable from −70 to +250°F and will not dry out, rot or shrink, are not affected by age or fungus.



How Nylok locks: Resilient nylon pellet (A) sets up lateral thrust, smoothly wedging mating threads together (B). Locking action is entirely on threads and is positive, seated or unseated. UNBRAKOs with Nylok are easy to remove and are reusable.

Regular screws loosen under vibration because external stresses cause marked variations in screw tension, resulting in motion between mating threads and loss of frictional holding power.

UNBRAKO socket screws with Nylok stay put, because they do not depend on screw tension to keep them tight. Here is how they work: A tough, resilient nylon pellet, inserted permanently in the threaded section of the screw, is the locking medium. Before assembly, the locking pellet projects slightly beyond the crest of the thread. When mating threads are engaged, it is compressed. Its springlike wedging action grips threads tightly and sets up a counterthrust, creating a strong metal-to-metal engagement of the mating threads. Locking is positive whether the screw is seated or not.

And the permanently installed nylon locking pellet retains strength characteristics from −70 to +250°F.

In addition to their remarkable resistance to loosening under the most severe operating conditions, UNBRAKO self-locking socket screws save production time. They eliminate the need for lockwashers under the heads of screws, drilling of heads for lockwires, cotter pins, and complex multiple set screw installations. And they can be used repeatedly without losing their locking ability.

See your authorized SPS industrial distributor for complete details. Or write SPS—manufacturer of precision threaded industrial fasteners and allied products in many metals, including titanium. Unbrako Socket Screw Division, STANDARD PRESSED STEEL CO., Jenkintown 33, Pa.

*T.M. Reg. U.S. Pat. Off., The Nylok Corporation

SPS **Jenkintown • Pennsylvania**

Standard Pressed Steel Co. • The Cleveland Cap Screw Co. • Columbia Steel Equipment Co. • National Machine Products Co. • Nutt-Shel Co. • SPS Western • Standco Canada Ltd. • Unbrako Socket Screw Co., Ltd.

means automatic cycling of blooming mills

. . . completely coordinated positioning of horizontal rolls and manipulators . . . automatic operation of the fingers . . . properly sequenced operation of the tables and feed rolls . . . precisely controlled timing of the start, stop, reverse and run of the main drive. This is but one of the many ways Westinghouse PRODAC† is helping bring about "the mill of the future" today through completely automatic cycling of blooming mills.

Westinghouse has service-proven PRODAC installations that economically automate slabbing mills, ingot buggy operations, reversing roughers, stock house materials handling and many other mill applications.

By specifying Westinghouse PRODAC for your mill, you open the door to many new cost-saving benefits which are unobtainable with conventional controls. For example, PRODAC assures the most consistent standards of quality control at the highest rates of production speed . . . coordinates operation of all machines at the over-all maximum efficiency . . . holds maintenance to a minimum and practically eliminates control failures . . . gives you a "building block" design which provides flexibility required for further mill automation.

The entire team of Westinghouse PRODAC engineers is at your service to help you determine exactly where and how PRODAC can benefit you. Your Westinghouse sales engineer can give you complete information, or write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-22112

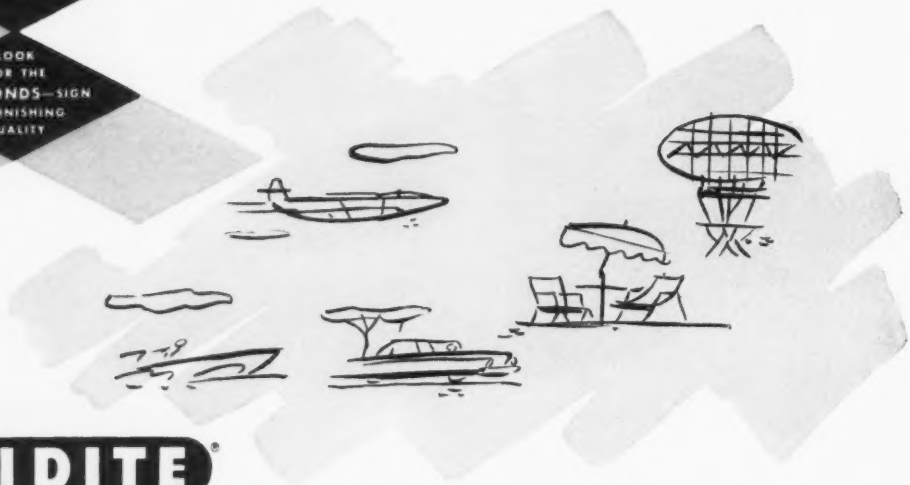
†Trade-Mark

*PROGRAMMED DIGITAL AUTOMATIC CONTROL

YOU CAN BE SURE...IF IT'S Westinghouse

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS" CBS TV MONDAYS

LOOK FOR THE DIAMONDS—SIGN OF FINISHING QUALITY



Only IRIDITE®

Process Engineered

Chromate Conversion Coatings

Give you 5 additional benefits for Corrosion Protection—Paint Base—Decorative Finishing

1 A COMPLETE PROCESS ENGINEERED LINE

Developed for specific applications, there is an Iridite to provide the finish you desire, fit the equipment you have available and give the performance you require. Most Iridite coatings meet rigid military and civilian specifications.

2 EXPERIENCED TECHNICAL SERVICE

Our large field engineering staff is thoroughly familiar with chromate conversion coatings and related finishing operations. They'll help you check every step in your finishing operation to make sure you're getting the best possible finish on your products.

3 PRODUCT AVAILABILITY

Warehouses located in strategic industrial areas enable us to provide you with fast, economical delivery on any Iridite.

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The superior performance of Iridite provides low final cost by extending operating life and lowering maintenance costs. In addition, Iridite gives you a finish that adds considerably to the value of your product. There's an Iridite to meet every cost and performance requirement.

5 RESEARCH AND DEVELOPMENT FACILITIES

If you have an unusual application, we will gladly work with you. Our entire staff of experienced engineers and chemists, and our completely equipped facilities are at your service.

IRIDITE—a specialized line of chromate conversion coatings for non-ferrous metals. Apply by dip, brush or spray methods — at room temperature — manually or with automatic equipment. Forms a thin film which becomes an integral part of the metal. Cannot chip, flake or peel. No special equipment, exhaust systems or specially trained personnel required.

If you are using chromate conversion coatings to finish zinc, cadmium, aluminum, magnesium, silver, copper, brass or bronze — consider the above benefits of Iridite. For complete information, contact your Allied Field Engineer. He's listed under "Plating Supplies" in the yellow pages. Or, write for FREE TECHNICAL DATA FILE.

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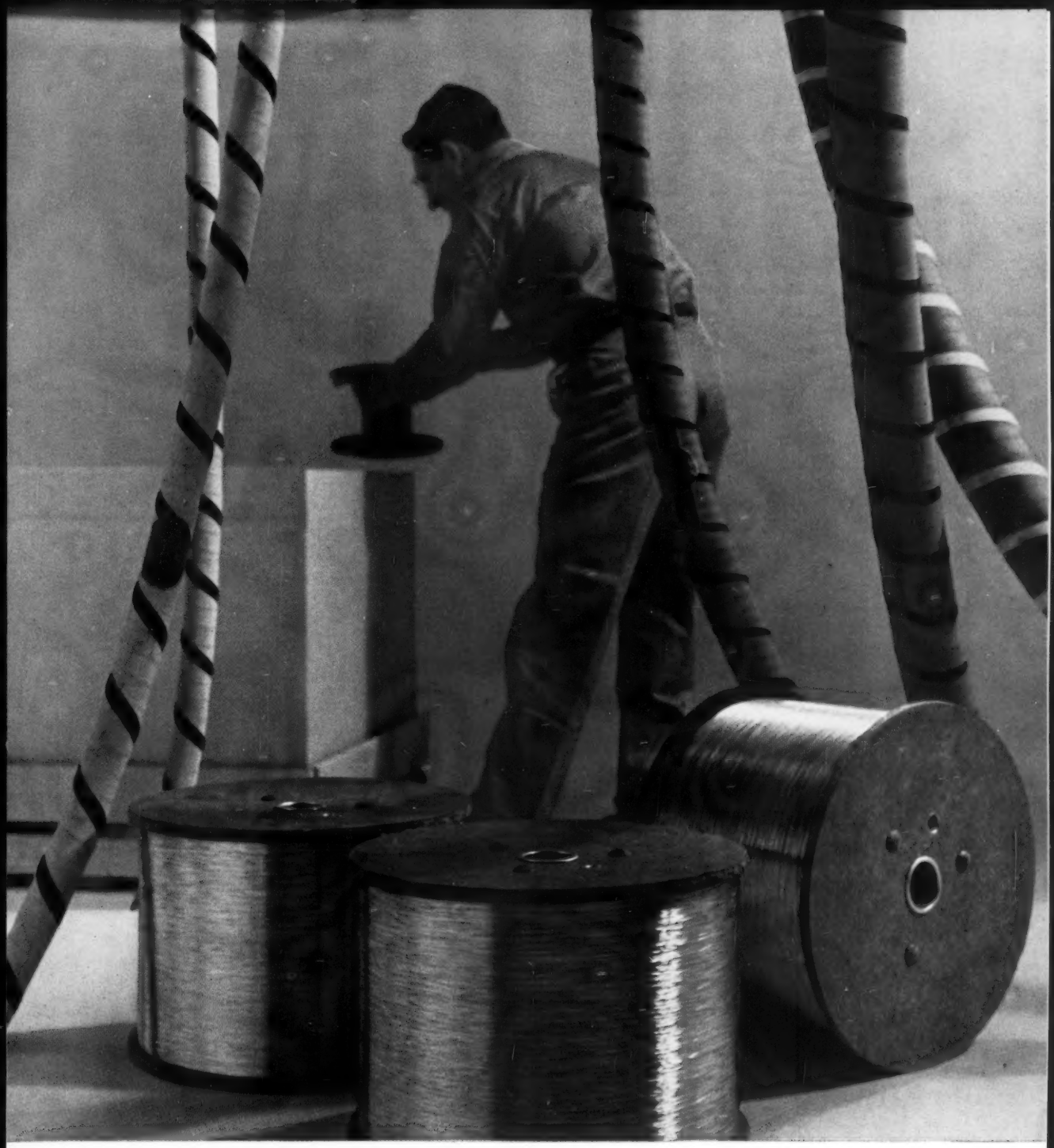
IRIDITE® Chromate Coatings	IRILAC™ Clear Coatings	ISOBRITE® Plating Brighteners	ARP® Chemicals & Supplies	WAGNER Line of Equipment



Roebling Hose Reinforcing Wire... The best things come in no-charge packages

When you buy Roebling Hose Reinforcing Wire it is delivered to you on no-charge spools that mean savings to you.

This modern method of packaging does away completely with deposits and the bookkeeping involved; it contributes, too, to lower freight costs. Thus, you avail yourself of a precision-made and quality controlled product, without any handling, shipping and inventory inconveniences.

Roebling Hose Reinforcing Wire, used for braiding reinforcement, is produced in a complete range of sizes. Write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

Roebling...Your Product is Better for it

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

THE OTHER TURN

LOOK OUT NOW, HERE COMES THE GAFFER WITH REAL FIRE IN HIS EYE.
YEH, YOU CAN ALWAYS TELL, CAUSE NEXT DAY HE'S GOT IT KICKED ALL OVER THE FLOOR.
OLD STOSH MUSTA BEEN OUT LATE AGAIN LAST NIGHT.
THANKS TO
TOM PHILLIPS
GENERAL MELTER FOREMAN
NO. 1 OPEN HEARTH
INLAND STEEL CO.
EAST CHICAGO, IND.
KUEKES

The Poor Soul

WHY NOT DESCRIBE YOUR OPEN-HEARTH CARTOON IDEA AND SEND IT ALONG TO US?

The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.

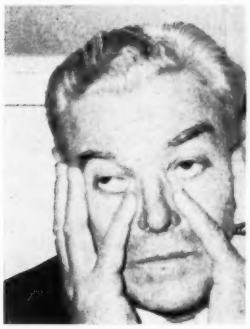
Magnefer and Syndolag Set Fast—Stay Fast

BASIC INCORPORATED 845 HANNA BUILDING • CLEVELAND 15, OHIO

Metalworking Outlook

July 6, 1959

McDonald Seeks a Face Saver

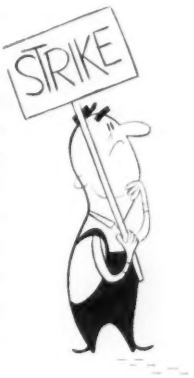


USW's chief, David McDonald (picture), is looking for a graceful means of exit from his position in steel industry bargaining. The two week deadline extension may save him from a strike that no one, including his steelworkers, wants. Chances for a noninflationary wage settlement now appear good. One possible solution: Revision of the featherbedding clause in exchange for a modest wage boost. Mr. McDonald could retreat honorably and steelmaking costs would not be increased (Page 39).

What Unions Are Settling for

The weighted average increase in wages (excluding fringe benefits and cost of living adjustments) won by unions in 140 contract settlements in the bellwether Cleveland area this year is 6.89 cents an hour, reports Associated Industries of Cleveland. The range: Five firms won settlements without wage boosts, one small company gave a 17 cent increase.

Labor Peace Likely in Aluminum Industry



This aluminum worker (cartoon) is undecided about going on strike. Chances are he won't. A peaceful settlement in the industry is even more likely than it is in steel. Major aluminum buyers are betting 3 to 1 against a strike. It's likely that the settlement will be much like steel's: Dave McDonald will have a tough time getting more for his aluminum workers than he gets for his steelworkers, and the Aluminum Workers International Union traditionally lets the USW be the tough guys in contract negotiations. But if the steelworkers walk out, chances are the aluminum people will follow. And aluminum users don't have the inventories to stand a strike like steel users do (Page 40).

Productivity Rate to Slow Down

Don't expect metalworking's productivity to keep climbing at the rapid rate it has since the recession. It will improve, but at a slower pace. Remember that during the first stages of the recovery the most experienced workers were operating your most efficient equipment at the optimum workweek. Now, you've rehired some marginal employees, are operating less efficient facilities to get out the production, and you may be paying some overtime.

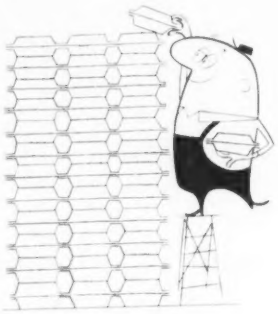
You're Paying More for College Talent

Chances are you're paying about 5 per cent more in starting salaries for college graduates this year than last. Lehigh University reports the average

1959 starting salary for its business administration grads is $427—up $13 from 1958. Engineering grads are getting $493—up $19. Arts graduates are starting at $406—up $25. Top salaries ($525—up $55) are going to engineering physics students. Electrical engineers are averaging $515; industrial engineers, $481; mechanical engineers, $490; metallurgical engineers, $490. The only group starting for less money this year than last are chemistry students; they're averaging $460—down $25.

Component Buyers Can Stand a Steel Strike

This little fellow (cartoon) is typical of component buyers today. He has built up large enough stocks to ride through a steel strike, if it comes. Respondents to STEEL's quarterly survey (Page 111) report these inventories: Less than ten days, 5 per cent; 10 to 30 days, 20 per cent; four to eight weeks, 41 per cent; 8 to 12 weeks, 23 per cent; three to six months, 11 per cent. Many buyers are still building inventories, and some are having trouble getting deliveries.



Founders See Full Recovery

Expect shipments of gray and ductile iron castings this year to better last year's mark by 30 per cent. That's the prediction of Donald Workman, executive vice president, Gray Iron Founders' Society. He anticipates '59 shipments of 13.5 million tons (vs. 10.4 million in 1958—the industry's worst year since 1946).

Construction Equipment Makers Build Up Optimism

Look for construction equipment sales to approach $2.2 billion this year for the second best year in history. Only two developments could stand in the way: 1. Failure of Congress to provide adequate financing for the interstate highway system. 2. Failure of states to come up with their share of the cost burden for the roads (Page 54).

A Record for Construction

Expect the construction industry to be one of the mainstays of the economy this summer (Page 61). The industry just chalked up a record half, with construction expenditures hitting a seasonally adjusted annual rate of $55.1 billion (vs. a $49.1 billion total for 1958). June outlays reached $5 billion —up $400 million from May.

Banker Looks for Another Recession

William F. Butler, vice president, Chase Manhattan Bank, New York, says that 1960 will be "a year of great prosperity" but that "another recession

could start in 1961." Reason: "We usually move ahead too rapidly in periods of expansion and so create the necessity of periods of recession to consolidate our gains and prepare for a renewed advance."

His Firm Scores Porcelain Enameling Breakthrough

Porcelain enamelers now have a new method to combat low cost competitive finishes. Called Direct-On by its developer, Harry T. Marks (picture), president, Ferro Corp., Cleveland, it covers steel with a single coat, instead of the usual two or three. One firing reduces or eliminates warping. Coatings are more flexible and tougher. All colors but red can be used. As a two coat method, the process is superior to conventional porcelain enamels. It marks a new step toward recapturing lost markets and moving into new ones (Page 76).

Speak Your Piece on Depreciation

Here's your opportunity, if you're a small businessman, to have your views on U. S. depreciation policy heard. The Senate Small Business Committee will hold hearings later this month. Sen. Alan Bible (D., Nev.) and Sen. George Smathers (D., Fla.) will report the result to Rep. Wilbur Mills's (D., Ark.) Ways & Means Committee or make legislative recommendations. To tell your story, contact Walter Stults, staff director, Small Business Committee, Senate Office Bldg., Washington 25, D. C.

Export Horizons Call Marketing Pioneers

Now is a good time to take advantage of the most important marketing frontier we have—the export market. Foreign markets, aided by billions of U. S. dollars and abetted by booming population growth, can still be lucrative for aggressive entrepreneurs. But time is running out. American metalworkers must get their feet in the foreign market door soon or good service and replacement markets will be lost, warn foreign trade authorities. The busy Timken shipping center (picture) at Bucyrus, Ohio, illustrates what can be gained by aggressive salesmanship (Page 44).

Russia Buys U. S. Textile Machinery

Whitin Machine Works, Whitinsville, Mass., has signed a contract to sell Russia about $3.2 million worth of textile machinery. Approved by the U. S. State Department, the contract will be filled late this year and early next year.

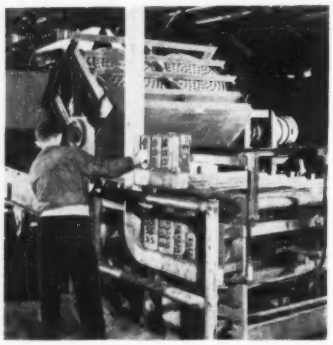
Tighter Lead and Zinc Curbs?

Interior Secretary Fred Seaton is considering tighter controls on imports of lead and zinc ores and concentrates. He is also talking with advisers about

controls on imports of fabricated products, say Interior sources. Tariff Commission spokesmen think there's a chance imports could be cut drastically.

Automation Pays Off for Foundry

Pearlitic and ferritic malleable irons are annealed and heat treated automatically at Marion Malleable Iron Works, Marion, Ind. The equipment improves product quality, reduces annealing time and costs, lowers labor requirements, permits better delivery. In operation about 17 months, the equipment has a monthly production capacity of 800 tons of pearlitic, or a combination of ferritic and pearlitic irons up to 1000 tons (Page 92).



Compare Your Car Mileage

The average passenger car traveled 9,391 miles in 1957 and used 652 gallons of fuel at a rate of 14.4 miles per gallon. The average truck traveled about 10 per cent more (10,328 miles) but used twice as much fuel (1312 gallons at a rate of 7.87 miles per gallon). The nation's 67.6 million motor vehicles traveled 647 billion miles in 1957; 6 miles out of 13 were on city streets.

Old Breed May Become Extinct

Solar Aircraft Co. has devised a missile that spells the end for an old American breed—fire truck chasers. Solar's fire fighting missile could reach a disaster scene five miles away in less than a minute and hover over it to spray a ton or more of extinguishing fluid on the flames. The firm is negotiating with a government agency regarding its use.

Intercontinental Commuting Is Possible

You could eat lunch in London and be in Los Angeles for an 8 a.m. appointment if Lockheed Aircraft Corp. sells its new transport to the airlines. The 2200 mph craft could leave London at 11 a.m., arrive in Los Angeles at 7:45 a.m., leave Southern California at 9 a.m. and return to London by 9:45 p.m. the same day. The delta wing transport would have a stainless steel and titanium structure, cost less to operate than present subsonic jet transports.

Straws in the Wind

Acme Steel Co. melted the first steel in its new $33 million, cupola oxygen converter on June 29; it was delayed from June 17 when technical problems arose . . . In December, J. I. Case Co. will start marketing a U. S. made diesel tractor to compete with small imported units.

LEDLOY*

Free Machining Steels for Forgings

LEDLOY

METALWORKING SHOPS FIND LEDLOY* STEEL FORGINGS SAVE TIME . . . TOOLS . . . FINISHED PART COSTS!

Metalworking shops in ever increasing number are specifying *Ledloy* steels in forgings. The trend started when it was found that forged parts made with *Ledloy* steels resulted in savings far surpassing the original higher cost of the forging. *Ledloy* is widely known as Inland Steel Company's trade name for any grade of steel to which lead has been added to obtain greater machinability. Forgings made from *Ledloy* steels can be heat treated and forged in exactly the same manner as similar non-leaded grades of open hearth steels, while machinability is increased up to 50% in many applications.

Thus, regardless of grade of steel in use currently for your product, if machining is an important part of the fabricating process, the experience of hundreds of metalworking plants has proven that a change to a similar *Ledloy* grade can definitely cut total machining cost in many cases.

cost-cutting factors:

Increased machinability, higher speeds and feeds, easier tolerance control, reduced tool wear, less down-time, greater production per tool change and fewer finishing operations.

Although it is well known that *Ledloy* Grade A can be machined 45% faster than B1113 and *Ledloy* Grade B 100% faster than B1112, it is not as widely realized that forgings made of *Ledloy* steels can show similar startling results. If present equipment is not being run at highest potential speeds, considerable savings can result using *Ledloy* grades and taking advantage of their much greater machining rate. Surface speeds of 325 feet per min. are common and much higher speeds are possible—up to 450 sfm with high speed tools and up to 600 sfm with carbide tooling when using Grade A *Ledloy* steel.

If current operations wear tools excessively, necessitating frequent tool changes, or if tooling cost is relatively high, *Ledloy* steels can effect significant savings. Because the Inland process of adding lead to steel lowers the steel's frictional component, less heat is generated during machining. *Ledloy* steel's shorter-length chips quickly fall clear of the tools, and tool-edge build-up is minimized. The end result, clearly discernable, is far greater production, less down-time for tool changes and a welcome reduction in total machining cost. *Ledloy* steel's lubricating and better-chip-forming qualities make it the fastest machining steel in the world. The superior surface finish obtainable with leaded steels can often result in the elimination of one or more subsequent finishing operations.

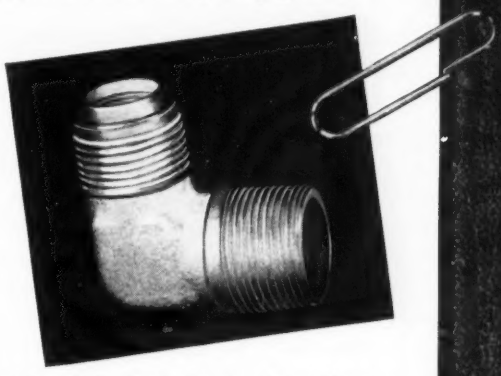
characteristics:

Inland regularly produces *Ledloy* free-machining open hearth steels to a wide variety of chemical specifications to meet customer requirements. In each instance, regardless of chemical composition, *the addition of lead by the Inland process results in no significant change in the desirable mechanical and metallurgical characteristics of the steel.* All the important qualities of open hearth steels such as ductility, impact values, transverse strength, case hardening qualities and cross sectional soundness, are fully retained. *The only thing changed is the machining characteristic which is vastly improved.*

availabilities:

Inland *Ledloy* free-machining steels are available in a wide range of standard carbon and alloy grades in bar form or plates. In forgings, the increase in machinability is every bit as good as that obtained in bar stock steel and finish is superior.

If your product requires machining, it will pay you to investigate the potential savings offered by Inland *Ledloy*—the original leaded steels. Ask your Cold Drawer or Steel Service Center about Inland leaded steels, today. They are offered as *Ledloy* or under other brand names. For the very informative booklet, "Properties of Inland Ledloy Steels," write to Inland Steel Company, 30 West Monroe Street, Chicago 3, Illinois.



A switch to Ledloy Grade A in these forged fittings permitted a 27% increase in machinability.

INLAND STEEL INLAND **LEDLOY STEELS**

the world's most machinable

*Reg. Trade Mark

Special Armco Stainless Steels Chosen for 2000 mph aircraft

High strength, resistance to heat and corrosion, and good fabricating characteristics of three special Armco PH Stainless Steels not only meet requirements for high-speed aircraft but improve performance of a wide range of other products.

Traveling at three times the speed of sound, 70,000 feet up, generates heat and stresses that demand metals with unusual properties. Armco PH 15-7 Mo has been chosen as the primary sheet and foil material for key elements of the manned B-70 "Valkyrie" intercontinental bomber and F-108 long range interceptor developed by North American Aviation, Inc., for the U. S. Air Force.

This new stainless is only one member of a versatile family of Armco Precipitation-Hardening Stainless Steels whose superior properties have been proved in a wide range of uses. Not only supersonic aircraft, but "down-to-earth" products such as valves, springs, bolts, specialty fasteners, shafts, and countless other products benefit from the durability and ease of fabrication of Armco 17-7 PH, 17-4 PH, and PH 15-7 Mo Stainless Steels.

It will pay you to consider the advantages these special Armco Stainless grades can give *your* products. For more information fill in and mail the coupon.

ARMCO STEEL CORPORATION, 2639 Curtis Street, Middletown, Ohio
Please send me more information about:
☐ PH 15-7 Mo ☐ 17-7 PH ☐ 17-4 PH

Name _____ Title _____

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ARMCO STEEL

Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

GAIN a Little...
GIVE a Little...

The extension in the steel wage negotiations is a good omen for a settlement that will not increase steelmaking costs.

The extension also provides Dave McDonald and the United Steelworkers with an out. They were saved, at least temporarily, from a strike that no one, including the union members, wanted.

In the nine weeks of bargaining, the steel companies maintained a firm front for a noninflationary settlement. Their position gained strength as negotiations progressed.

The union's demand for a big basket of wage and other concessions was never strong and grew weaker as the talks wore on.

The industry's strength stems mostly from American weariness with rounds of wage increases followed by rounds of price adjustments. As a nation, we are fed up with unions forcing wages far ahead of gains in productivity.

In the early postwar days, a little inflation provided an illusion of prosperity, just as a cocktail or two induces a sense of well-being. Kept up for thirteen years, the illusion wore thin. We are now in the hangover stage.

Scores of surveys of steelworkers show union members do not want to strike. Few are even much interested in wage increases. They are more concerned over maintaining steady employment. They understand economic facts better than their leaders.

Chances for a noninflationary wage settlement now appear good. Possibly, it will be achieved without a general strike.

A sensible solution is available. The steel companies last month proposed eight contract revisions to increase production efficiency. The most important of those—revision of Section 2-B, sometimes called the featherbedding provision—is estimated to have potential savings of seven or eight cents an hour. If the union were to agree to the revisions, we suspect the companies would be happy to give Mr. McDonald a modest settlement.

Such a "gain a little, give a little" settlement would brake wage-push inflation. It would establish a wholesome pattern for other industries. And it would enable Mr. McDonald to retreat with dignity and honor.

Walter J. Campbell

EDITOR

5 Reasons why it pays to buy from Ryerson

MOST DIVERSIFIED STOCKS—Ryerson inventories include by far the widest range of types, shapes and sizes available anywhere.

FAST SERVICE—A combination of varied stocks, modern equipment and an experienced staff means stepped-up processing for *regular requirements* and unparalleled ability to meet the most urgent *emergency needs.*

HIGHEST QUALITY—New quality-control standards, completely detailed and published, govern every aspect of Ryerson specifications and operations. Here is steel that's *certified* for dependable performance, and cut to your most *exacting* requirements.

TECHNICAL HELP—Experienced specialists, well qualified to work with you on problems of replacement and selection, help you achieve optimum value for your steel-buying dollar.

INTEGRITY—The nationally recognized leader in its field, Ryerson values your patronage much too highly to sacrifice your long-term good will for any immediate gain. 117 years of fair dealing—at your service.

LET RYERSON CARRY YOUR INVENTORY—Whatever your maintenance steel needs, you get one-call, one-order delivery at Ryerson. Order today.

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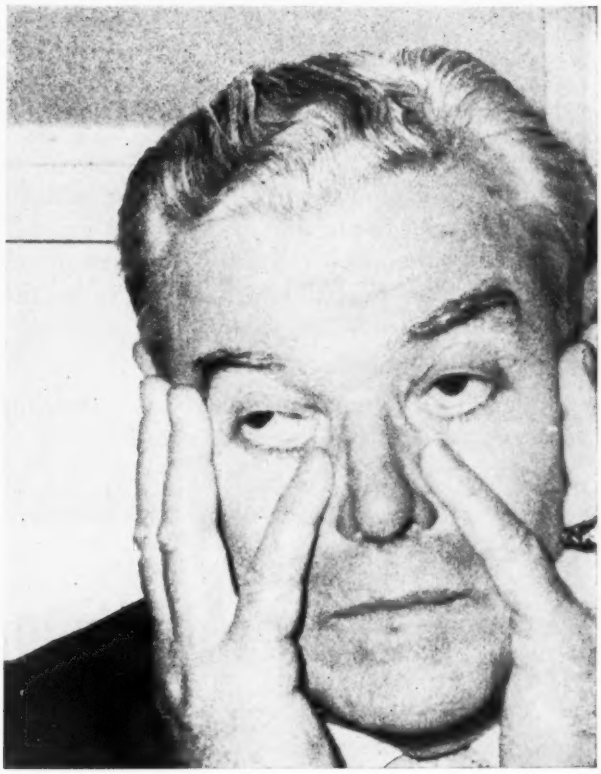
STEEL • ALUMINUM • PLASTICS • METALWORKING MACHINERY

NATION'S MOST COMPLETE SERVICE CENTERS IN PRINCIPAL CITIES COAST TO COAST

McDonald Frets Over Way Out In Steel Dispute



UPI

UNITED STEELWORKER President Dave McDonald is in retreat, searching for some way to snatch at least partial victory.

His swift acceptance June 27 of a contract extension until 12:01 a.m., July 15, without any retroactivity proves how far he has backed down.

• **Only One Big Weapon Left**—Poll after poll indicates public opinion doesn't support the USW's arguments. Newspaper surveys nearly unanimously show that his own members have little stomach for a strike. The government has vetoed a fact-finding panel, a route by which unions have won many a victory in the past.

The important weapon left is a strike, which nobody wants. Mr. McDonald will use it only if he can get nothing from industry that he can call concessions for his members. He'll readily agree to at least one more contract extension if he sees any hope for a way out. Particularly, he'll be anxious to direct attention to steel's second quarter and first half earning reports, which are expected to be excellent. They're normally available in the last third of July.

• **No Break**—As of last week, the steel industry was still adamant in its position: No net increase in employment costs. The steel industry's chief negotiator, U. S. Steel Corp.'s R. Conrad Cooper, denied any possibility that the companies would agree to raise wages without raising prices. And steelmen don't want to raise prices and open the door wider to competition from abroad and from other materials.

• **A Way Out?** — Labor observers point to one escape from the impasse. Higher wages might be offered the USW if it would agree to contract changes which would permit greater efficiency in steelmaking. Mr. McDonald heatedly turned down the idea when industry proposed it, so the companies withdrew it.

The changes, as first advanced June 10:

1. Modify ambiguous and restrictive language to facilitate operating improvements.

2. Reinforce the contract prohibitions against wildcats, slowdowns, and picketing.

3. Recognize the functions of management to develop incentives and establish sound standards.

4. Clarify the right of the companies to change work schedules.

5. Tighten vacation provisions.

6. Eliminate overlapping or duplicated benefits.

7. Simplify seniority procedures.

8. Generally clarify contract language to develop better understanding and co-operation among the working force.

Although not specifically mentioned, the industry is particularly anxious to amend Section 2-B of the contract which states that past practices must remain in effect for the life of the contract. Some sources believe 2-B is costing industry as much as 7 or 8 cents an hour. If USW agrees to all or even some of the eight changes, steel could raise wages without hiking costs.

Aluminum May Settle Without a Strike

Producers have a good chance of a peaceful settlement, especially if terms are reached in steel without a strike. Companies will probably be willing to grant modest increases without too much fuss—settlements will closely parallel those in steel. Union politics, rather than a stalemate at the bargaining table, looms as the biggest threat to labor peace.

Prices will go up—it's unlikely the companies would freeze prices even if the union agreed to hold the line for a year.

A PEACEFUL labor settlement is even more likely in aluminum than it is in steel.

Some industry observers point out that the aluminum companies traditionally have been able to settle labor difficulties quickly. Among major consumers, the odds for "no strike" run 75 to 25.

• **Demands**—The two chief aluminum unions, United Steelworkers of America and Aluminum Workers International Union, have begun preliminary talks with management. USW officials say its demands will pretty closely parallel those made

When Aluminum Contracts End

ALUMINUM CO. OF AMERICA

Location	Type of Plant	Yearly Capacity (tons)	Union	Expiration Date
Alcoa, Tenn.	Reduction	157,100	USW	July 31
Badin, N. C.	Reduction	47,150	USW	July 31
Bauxite, Ark.	Alumina	420,000	USW	July 31
Bridgeport, Conn.	Castings	n.a.	USW	July 31
Chicago	Diecastings	n.a.	UAW	July 31
Chillicothe, Ohio	Cooking Utensils	n.a.	AWI	July 31
Cleveland	Castings, Forgings	n.a.	UAW	July 31
Cressona, Pa.	Extrusions, Impacts	n.a.	AWI	July 31
Davenport, Iowa	Sheets, Plates, Foil	n.a.	AWI	July 31
Detroit	Castings	n.a.	USW	July 31
East St. Louis, Ill.	Chemicals, Fluorides	n.a.	AWI	July 31
Edgewater, N. J.	Sheets, Plates	n.a.	USW	July 31
Garwood, N. J.	Diecastings	n.a.	UAW	July 31
Lafayette, Ind.	Tubes, Extrusions	n.a.	AWI	July 31
Lancaster, Pa.	Fasteners, Screw Machine Products	n.a.	AWI	July 31
Los Angeles	Forgings, Tubes, Castings, Extrusions, Fasteners	n.a.	UAW	July 31
Massena, N. Y.	Reduction	118,000	AWI	July 31
	Rods, Bars, Cable, Wire, Structural Shapes	n.a.		
Mobile, Ala.	Alumina	985,500	USW	July 31
New Kensington, Pa.	Tubes, Extrusions, Foil, Powder and Paste, Cooking Utensils, Fittings	n.a.	USW	July 31
Point Comfort, Tex.	Alumina	750,000	USW	July 31
	Reduction	120,000		
Richmond, Ind.	Collapsible Tubes, Jar and Bottle Closures	n.a.	USW	July 31
Rockdale, Tex.	Reduction	150,000	USW	July 31
Vancouver, Wash.	Reduction	97,500	AFL-CIO Trades Councils	July 31
	Rods, Wire, Cable, Extrusions	n.a.		
Wenatchee, Wash.	Reduction	108,500	AFL-CIO Trades Councils	July 31

ANACONDA ALUMINUM CO.

Location	Type of Plant	Yearly Capacity (tons)	Union	Expiration Date
Columbia Falls, Mont.	Reduction	65,000	AFL-CIO Trades Councils	Nov., 1960
Fair Lawn, N. J.	Foil Laminating	n.a.	Textile Workers	Oct. 1
Louisville	Foil Rolling	n.a.	AWI	Oct. 2
			Machinists	Oct. 1
			IBEW	May, 1960
Louisville	Foil Laminating	n.a.	AWI	Oct. 2
			Machinists	Oct. 1
			IBEW	May, 1960
Louisville	Rigid Container	n.a.	AWI	*
			Machinists	Nov. 1
Terre Haute, Ind.	Sheets, Extrusions	n.a.	**	...

KAISER ALUMINUM & CHEMICAL CORP.

Location	Type of Plant	Yearly Capacity (tons)	Union	Expiration Date
Baton Rouge, La.	Alumina	850,000	AWI	Oct. 31
Bristol, R. I.	Insulated Wire and Cable	18,000	Rubber Workers	Sept. Reopening
Chalmette, La.	Reduction	247,500	AWI	Oct. 31
Dolton, Ill.	Extrusions, Conduit	15,000	USW	n.a.
Erie, Pa.	Forgings, Impacts	6,000	UAW	Dec., 1959
			Die Sinkers Council	Dec., 1961
Gramercy, La.	Alumina	430,000	USW	July 31
Baltimore	Extrusions, Pipe, Tubes	32,000	USW	July 31
Newark, Ohio	Rods, Bars, Wire, Cable	172,000	USW	July 31
Ravenswood, W. Va.	Reduction	145,000	USW	July 31
Ravenswood, W. Va.	Sheets, Plates, Foil, Building Products	170,000	USW	July 31
Spokane, Wash. (Mead Works)	Reduction	176,000	USW	July 31
Spokane, Wash. (Trentwood Mill)	Sheets, Plates, Tubes, Building Products	198,000	USW	July 31
Wanatah, Ind.	Food Containers	8,000	AWI	Oct. 31

of steel. The AWI lists these major demands:

- Substantial general wage increases.
- A 36 hour workweek at 40 hour pay.
- Freezing the present 17 cent an hour cost of living increase into the permanent wage structure (it's now flexible, varying with the cost of living index).
- A full union shop.
- Freezing of local practices, such as those covering crew sizes and job duties.
- Changes in job classifications.
- Increases in overtime, holiday, and shift pay.
- An additional paid holiday (Dec. 24).
- Additional vacation benefits.
- Changes in seniority and job classifications.
- Additional Supplemental Unemployment Benefits.
- Additional insurance benefits.
- A severance pay plan.
- Numerous other demands.

• **What They'll Get**—The unions won't win that much. It's likely that the aluminum settlement will closely follow steel's. It's unlikely that Dave McDonald would be able to push through, or even demand, more than he could get for his steelworkers. The AWI traditionally lets the USW be the most militant in contract negotiations. On occasion the USW has struck and the AWI hasn't. The same thing could happen this year.

If steel is on strike at the end of July, many believe the USW will walk out at aluminum plants. All other considerations aside, trade sources say it just wouldn't be politic for Mr. McDonald to allow a settlement in aluminum while the steelworkers are still out. Another reason, says one of the country's largest users: Steel has done an excellent job in alerting customers to build inventories—aluminum has not. So the aluminum consumer is not in as good a position as the steel consumer to withstand a strike.

• **Nearly All Affected**—If the aluminum workers whose contracts expire on July 31 walk out, it will bring U. S. output of the metal to a virtual halt.

Here's how a general strike would affect the U. S. market picture and your chances for obtaining metal:

- Aluminum Co. of America and Reynolds Metals Co. would be shut down immediately.
- Kaiser Aluminum & Chemical

Location	Type of Plant	Yearly Capacity (tons)	Union	Expiration Date
OLIN MATHIESON CHEMICAL CORP.[1]				
Chattanooga, Tenn.	Wire, Cable	n.a.	UMW	Sept. 1
East Alton, Ill.	"ROLL-BOND" Heat Exchange Products	n.a.	Machinists	Dec., 1961
Gulfport, Miss.	Extrusions	n.a.	AWI	Jan., 1960
Hannibal, Ohio	Plates, Sheets, Strip	n.a.	USW	July 31
ORMET CORP.				
Burnside, La.	Alumina	345,000	AFL-CIO Trades Council	Nov., 1960
Hannibal, Ohio	Reduction	180,000	USW	July 31
REVERE COPPER & BRASS INC.[1]				
Baltimore[2]	Sheets, Extrusions	n.a.	AFL-CIO Local	Dec., 1960
Chicago[2]	Sheets	n.a.	UAW	Oct., 1961
Newport, Ark.[2]	Foil	n.a.	Machinists	Dec., 1960
REYNOLDS METALS CO.				
Arkadelphia, Ark.	Reduction	55,000	USW	July 31
Bauxite, Ark.	Alumina	730,000	USW	July 31
Brookfield, Ill.	Sheets, Plates	192,000	USW	July 31
Corpus Christi, Tex.	Alumina	730,000	AWI	July 31
Corpus Christi, Tex.	Reduction	95,000	USW	July 31
Grand Rapids, Mich.	Extrusions	13,500	n.a.	n.a.
Harrison, N. J.	Printed Products	4,072	Printers' Unions	n.a.
Longview, Wash.	Reduction	60,500	AWI	July 31
Louisville (Plant 1)	Foil	25,000	AWI	July 31
Louisville (Plant 3)	Powder, Pigments	9,000	AWI	July 31
Louisville (Plant 15)	Extrusions	5,000	AWI	July 31
Malvern, Ark.	Reduction	109,000	USW	July 31
Phoenix, Ariz.	Extrusions, Tubes	32,500	USW	July 31
Richmond, Va. (South Plant)	Foil	25,000	AWI	July 31
Richmond, Va. (North Plant)	Extrusions	12,000	AWI	July 31
St. Louis	Printed Products	3,780	AWI	July 31
Sheffield, Ala. (Plant 1)	Reduction	77,500	AWI	July 31
Sheffield, Ala. (Plant 2)	Reduction	112,500	AWI	July 31
Sheffield, Ala.	Sheets, Foil	144,000	AWI	July 31
Sheffield, Ala.	Wire, Rods, Bars, Structurals	30,000	AWI	July 31
Sheffield, Ala.	Cable	25,000	AWI	July 31
Sheffield, Ala.	Foil	14,000	AWI	July 31
Sheffield, Ala.	Covered Wire	3,084	AWI	July 31
Sheffield, Ala.	Welded Tubes	3,000	AWI	July 31
Troutdale, Oreg.	Reduction	91,500	USW	July 31
ALUMINIUM LTD.				
Arvida, Que.	Reduction	370,000	National Syndicate of Aluminum Workers	Sept., 1960
Beauharnois, Que.	Reduction	35,000	National Syndicate	Nov., 1960
Isle Maligne, Que.	Reduction	115,000	National Syndicate	Oct., 1960
Kitimat, B. C.	Reduction	180,000	USW	June, 1960
Shawinigan Falls, Que.	Reduction	70,000	National Syndicate	Oct., 1960

*Contract expired Apr. 1, but it was extended to the end of the first pay period beginning on or after Oct. 1, or to a date one week after a new contract has been negotiated at the other two Louisville plants, whichever is later.

**Aluminum Worker's AFL-CIO won an NLRB election on June 9, but the government has not certified the election.

[1] Olin Mathieson and Revere jointly own Ormet and take all its production.

[2] These three mills also fabricate copper and brass products.

n.a. Not available.

Corp. would be affected in all major facilities except two: It would be able to operate its alumina plant at Baton Rouge, La., and its reduction operation at Chalmette, La., until Oct. 31, the date of contract expirations at those two points.

- All Anaconda Aluminum Co. mill facilities could continue operations until the fall. Its 65,000-ton-a-year Montana reduction plant would be immune: A new contract that expires on Oct. 31, 1960, was signed May 1.
- Harvey Aluminum Inc. will continue to operate. Its employees are not unionized. Workers at the Torrance, Calif., fabricating plant (extrusions, impacts, forgings, rods, bars) and the 55,000-ton-a-year primary plant at The Dalles, Oreg., recently voted "no union" in National Labor Relations Board elections.
- Ormet Corp.'s reduction plant would be shut down. However, all but one of the fabrication plants operated by its two owners, Olin Mathieson Chemical Corp. and Revere Copper & Brass Inc., would be able to operate until their pig stocks were used up (see table).
- Aluminium Ltd. has no contracts expiring at its Canadian reduction facilities this year. Six plants, with a total capacity of 770,000 tons, have contracts that carry over until 1960.
- The secondary aluminum industry won't set any pattern as far as walkouts are concerned. Unlike the primary group, it doesn't have two or three unions that dominate the industry. For example, contracts range from those with the stockyard workers to those with the foundry workers. Some contracts will expire, but the bulk of smelters will be able to operate throughout the summer.
- Market observers don't think a strike would cause as heavy an influx of overseas metal as one might have a few months ago. Recently, there has been some strengthening in foreign markets—less exports to the U. S.

Unless you have built ample stocks your chances of obtaining adequate metal are slim if a strike comes. The previously listed facilities that could operate in event of a strike and the estimated 15 million to 20 million lb of metal in the hands of distributors would help ease the bite. But supplies would still be critically short within a few weeks.

• **Not Enough Stocks**—A check by STEEL in five major metalworking areas reveals users have been attempting to build inventories for several months as a hedge against a work stoppage. Most have only been partially successful. The reason: Business improved faster than anticipated—material scheduled for inventory had to be diverted to the production line to fill incoming orders. Typical is the Ohio firm which reported it was aiming at a 90 to 120 day inventory but will end up with 60 to 90 days.

The auto companies reveal they are building a 30 to 45 day float of aluminum for auto trim parts. Most of the stockpiling is in bright sheets for trim and in extrusions. Other firms in the area want to have at least a 30 day supply.

Users will continue building stocks through July. Inventories of firms contacted by STEEL will range from a low of 15 days to a high of 120. The median: 30 to 60 days.

Some tightness (particularly in sheets, foil, billets, and extrusions) has accompanied better business and the inventory buildup. In most cases, it has taken the form of longer delivery times. A New York appliance maker says the former lead-time of two to four weeks has shot up to three to six weeks.

• **Prices Will Rise** — Aluminum prices will go up this year. The industry says it can't possibly absorb any wage increases. They'll have to be passed on. Even if the industry is able to hold the line against wage boosts, quotations will probably go up.

Here's why: A year ago in April, the price of pig was dropped 2 cents a pound on the theory that lower prices mean higher demand—a theory that didn't pan out. Last August, the industry raised the pig quotation 0.7 cent a pound to partially compensate for increased labor costs that went into effect then.

Aluminum people point out that the industry's bulk markets have been deliberately developed by them. This means prices have to be influenced by development expenses as well as production costs. Prices aimed too low mean inadequate research funds, they say.

Balancing that viewpoint is the realization that if you charge too much you discourage greater use of the metal. So the aluminum people will look for a middle of the road pricing policy to get "adequate" profits without hurting business.

• **How Much?**—In practical terms,

THIS ALUMINUM CAR ROOF shows one of the many finishes obtainable with the metal. It can be brushed, as above, embossed, or etched, and given a variety of colors. Weight: 35 lb less than a conventional roof

the situation adds up to a hike of 1 to 2 cents a pound on pig. Many believe it will be 1.3 cents—the amount needed to bring the price up to the year ago level. Mill product prices will probably rise more. Some guesses range as high as 15 to 20 per cent. Labor settlements will be a factor, but only a secondary one, in determining these price advances.

An outside possibility: Only mill product prices will rise. This would come about if U. S. producers decide to up the price on pig and Canadian producers refuse to go along. It would mean backtracking on the increase in the pig price and possibly higher increases on mill products than originally planned.

• **Another Possibility**—It's possible you could see a hike before an aluminum contract is signed. The guarantee that the industry gave its customers last December (no price hikes for six months) ran out at the end of last month. Some think the industry might put through a "restoration" that would bring the price to the levels of two years ago, then tack on whatever the new labor pact costs when contracts are signed.

• **Summing Up**—Chances are fairly bright that there'll be no labor walkout in aluminum. If one comes, it probably won't be lengthy. Prices will rise regardless of what happens. The inability of consumers to build up stocks to the level they would like could cause serious difficulties if a strike were to last more than a few weeks. If a strike comes, shipments will cease immediately. It would take about two weeks to get potlines back into production.

Copper Strike Threat Fades

DESPITE the breakdown last week in negotiations between Kennecott Copper Corp. and two unions representing workers at its Western Mining Div., there is little likelihood of a major copper industry strike in the immediate future. What is likely: More sparring on economic and health and welfare issues until both sides get a clear indication of what the steel settlement will be.

Some 30 contracts in the copper industry expired last week. Most were with the International Union of Mine, Mill & Smelter Workers. But the industry continued its operations, largely because:

1. Mine-Mill had previously announced in effect that its workers would stay on the job as long as there is some progress in negotiations.

2. Kennecott's contract with the United Steel Workers (representing about 2000 workers at the Garfield, Utah, smelter) does not expire until July 31. It probably will be influenced by the settlement in steel and in turn influence Mine-Mill settlements.

• **Market Favors Producers** — Observers point out that the weakness in the copper market also works against a major walkout. The price of custom copper has dropped four times since mid-June and the market has dried up. Stocks generally are good.

• **Stage Set**—But don't rule out the possibility of a strike. Mine-Mill workers last week voted to authorize the union's executive board to call one at any time. The union is working on a day-to-day basis.

The main disagreements center on economic issues, although little progress is reported on health and welfare negotiations. Kennecott claims that Mine-Mill's vague demands add up to about $2 an hour. Company officials declare they can't come up with an offer until the union becomes more realistic.

The International Association of Machinists is the only union so far to make specific wage demands. Kennecott says they total about 45 cents a hour, with about one-third representing a straight wage increase.

• **Same Boat**—No significant progress has been reported in negotiations between Phelps Dodge Copper Corp., Anaconda Co., American Smelting & Refining Co., and their local Mine-Mill unions. But neither management nor labor is anticipating any immediate trouble.

Strikes Mar Steel Truce

STEEL INDUSTRY and lake ore shipping officials were wrestling last Wednesday with wildcat and other unexpected strikes on the first day of the 14 day contract extension with the United Steelworkers.

A walkout by unlicensed ore carrier seamen, members of Local 5000, United Steelworkers' Seamen's Division, idled a number of ships in the lake fleets. An outbreak of wildcat strikes idled some steelmaking operations at Aliquippa, Pa., Cleveland, and Fairless, Pa.

A wholesale strike of the USW seamen's unit would idle 3700 unlicensed sailors on 137 ore carriers operated through 12 shipping companies. The lake shippers said they had received no strike notice; most had assumed that the extension of current steel contracts until July 15 also applied to the seamen's contracts. Officials of Local 5000 said the local's negotiating committee had vetoed a contract extension.

Steel company officials said a shutdown of lakes shipping would have little effect on steel mill operations this summer, but would eat into winter ore reserves.

• **McDonald Acts**—David J. McDonald, USW president, said in New York he would take "prompt and vigorous action" to end the wildcats. He added seamen were included in contract extensions.

Exports: Frontier for Marketing

NOW is the time for metalworking to take advantage of what foreign trade authorities call "the most important marketing frontier we have."

Mushrooming foreign markets, created in large part by billions of exported U. S. dollars and prodded by booming population growth, can still be claimed by aggressive enterprise. The European Common Market, as well as other prospective economic communities in South America and the Far East, are considered potentially as important as the U. S. market by one export executive.

But time is running out. The authorities warn: Unless American business gets a foot in the door with original sales, lucrative service and replacement markets may be lost. Listen to Herbert C. Murrer, president of the Murrer Tool Co., Cincinnati, and member of a recent U. S. Department of Commerce trade mission to Eastern India: "We cannot afford to lose these Oriental markets. I believe the future depends on these market areas." Another trade mission member, Harvey F. Swenson, president of the Sweden Freezer Mfg. Co., Seattle, adds: "Our years of opportunity (in the Far East) can be counted on the fingers of one hand."

• Market research is your first and easiest step in going international.

Accurate information on foreign trade climates and trends is available from the U. S. Department of Commerce—much of it from the field office nearest you. Many of the reports are minutely detailed and cover a wide range of topics. In addition, special trade missions around the world collect and compile firm proposals by foreign businessmen for setting up trade combinations and import agreements.

• Selling can be handled just like it is near home. Ready-made sales organizations are available at lowest cost.

An endless variety of selling techniques has been developed by experienced world traders. One of the simplest and safest methods is used by White Motor Co., Cleveland, an exporter of heavy duty trucks since 1913. White sells to distributors who buy for their own accounts, assume all risks of inventory and credit.

By far the most popular setup involves a domestic standby, the manufacturers' agent. Typically, he is paid a commission on sales and represents a number of principals. The biggest drawback to using the agent's services is also familiar here—getting him to devote maximum time and effort to selling your prod-

H. E. Markley Tells How Timken Approaches World Trade...

TIMKEN Roller Bearing Co., Canton, Ohio, is adding millions of dollars worth of foreign capacity to an already far-flung organization of international representatives and sales companies. While some domestic companies are lamenting a serious drop in export sales and complaining of vanishing foreign markets, Timken has just opened a new plant in Australia, is building a new plant in eastern France to supplement production in Paris, and is contemplating another new plant in Brazil. Vice President H. E. Markley explains Timken's foreign expansion this way:

"The answer is competition. Prior to and for a few years after World War II, U. S. products enjoyed world-wide prestige and were sold successfully in foreign markets. Then certain changes took place. Our costs—wages, fringe benefits, and the things we buy—spiraled at a rate not justified by improvements in productivity.

"New bearing plants were built in countries such as Germany, Italy, and Japan with machinery often more modern than ours. These efficient plants are operated by employees whose earnings are from one-tenth to one-third of the earnings of our employees. Bearing plants in England, France, and Sweden were greatly expanded. Australia, Brazil, India, and Argentina developed aggres-

uct. One refinement has been worked out in Cleveland by Baker Industrial Truck Div., Otis Elevator Co. Its agent also handles noncompetitive material handling gear, offers a complete line of goods to foreign buyers.

• Obviously, you can't afford your own salesmen until export volume justifies it.

By the time your 10 per cent sales commissions to export or manufacturers' agents reach a consistent five figure level, you may want to hire your own man. When you do, bear in mind the unanimous advice of seasoned exporters: Do your day to day selling with foreign nationals. A foreign post may seem like a fitting promotion for Joe Jones, the company's top salesman, but experts will tell you that a native of the sales territory is cheaper to maintain and not as likely to rile some proud and nationalistic foreign customers. Also, you won't have to worry about Mrs. Jones getting incurable homesickness in six months.

• Real success should result in outgrowing your domestic production for export.

By the time you're handling foreign volume to match that of Timken Roller Bearing Co., Canton, Ohio, you'll be ready to set up subsidiary sales companies abroad and assign to the corporate level export department the job of scheduling and allocating shipments from foreign production plants. Timken Vice President H. E. Markley (see bottom of Page 44) foresees the day when little exporting will be done by domestic plants, but export officials will direct a network of foreign producing and selling facilities.

• Some U. S. producers find they're being crowded out of world markets by foreign competitors.

Experienced export managers have some suggestions as to how you can keep selling foreign markets.

• Don't be afraid of foreign selling; it's easier than it looks, advises James B. Carpenter, export manager, Baker Industrial Truck Div. He points out that all the necessary export services and documentation can be rendered by banks, freight forwarders, and export houses.

• When in Rome, you must deal with the Romans. This means: Don't oversell your market. Miss Dorothy Kimmel, vice president of Lempco International, Cleveland, asks: Why try to sell your fanciest automatic machinery in an area where production is still low, labor cheap and plentiful? An older model, simpler and stripped of automatics, can be sold at a lower price.

• Develop special export lines. C. E. Schwartz, export manager for White Motor, tells of equipping export models with a heavier but standard, axle. Foreign truckers, unhampered by load limit laws, typically overload trucks, expect superior performance anyway. A special export product developed by the Gabriel Co., Cleveland, is just being introduced domestically. It's an adjustable auto shock absorber, designed for the wear and tear of primitive foreign roads.

• Don't worry about underselling competitors. Exporters are unanimous in telling STEEL that trademark identification, respect for quality, and U. S. preferences are still strong enough to offset a 10 to 15 per cent price disadvantage on U. S. products.

• Don't overlook foreign sales you may secure by offering credit terms. Foreign producers are snagging some South American markets by offering pay-as-you-go plans. But be wary of credit and collection policies in each country you deal in; some governments won't enforce your default agreements. One exporter assigns term payment goods in Mexico to his local agent who repossesses in his own name if the account goes bad.

• Revise your pricing base. One exporter recommends establishing special export prices, not based on domestic overhead. A reduced profit margin will be balanced by world trade volume, he says, adding:

• Know your market and predict your export sales volume. Market information and accurate knowledge of potential sales are essential to intelligent export planning.

American business has never before lacked the ingenuity to bargain profitably in world markets; professional exporters agree that tomorrow's markets are worth the effort.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service STEEL, Penton Bldg., Cleveland 13, Ohio.

sive programs to industrialize. Germany, France, Italy, Belgium, Holland, and Luxembourg have formed the European Common Market.

"To meet these changed conditions, our company must make bearings at costs equivalent to those of our competitors. This means we must manufacture in the same countries with the same labor. There are other advantages. We can sell more aggressively if we can ship from different countries. This gives us flexibility in overcoming such impediments as tariffs, (British) empire preferences, exchange controls, currency restrictions, import licenses, and restricted sales in the Common Market.

"In our foreign operations, we constantly try to increase business for our U. S. and Canadian plants. In most countries, a complete range of bearings is not available. Customers who become acquainted with us through locally made bearings can then be persuaded to import supplemental sizes from the U. S. By these methods, we are creating our own market for components.

"Whether or not we continue to progress as a domestic leader may well depend upon our ability to extend (our) reputation for quality and service at a competitive price into the world market."

Cross Says Cost Spiral Drives Plants Abroad

CONCERN over the number of American firms being forced by the U. S. wage-price spiral to build overseas plants is voiced by Ralph E. Cross, executive vice president of Cross Co., Detroit. Mr. Cross warns that continuation of the trend (see Page 44) will create voids in the nation's economy and result in a serious deterrent to economic expansion and prosperity. He declares that industry must invest $40 billion annually in plant and machinery to maintain present jobs and provide new jobs for the 400,000 to 500,000 people entering the labor force each year.

• **Jobs Cost Money**—"Every new job costs $12,000 to $15,000, and every job in existence requires an expenditure of $500 annually to keep it alive," he says. "When this money is diverted to foreign plants and equipment, the U. S. not only loses the capital required to create job opportunities but also loses reservoirs of future profits and taxes."

Mr. Cross sharply criticizes labor union efforts to boost trade barriers, or plans to force wage levels up in Europe, while attempting to dampen applications of technology at home. "Last February, the UAW's Walter Reuther became concerned with the competitive position of the American auto industry and called for international fair labor standards or tariffs as a means of keeping competitive with foreign manufacturers.

"On the other hand," says Mr. Cross, "Jack Connelly, the UAW representative to the National Planning Organization is demanding laws to regulate automation to protect workers' jobs. These moves toward regulation are designed with the idea of maintaining the status quo and are diametrically opposed to the action we should be taking to stimulate industrial growth and employment."

• **Capital Recovery Needed** — Mr. Cross contends that if we are to maintain competitive superiority, we must have a high rate of technological progress and provide proper incentives for business to keep pumping large amounts of capital into new products, plants, and equipment. "Since depreciation provides one of the major sources of funds for technological progress, it is essential that capital invested in machinery and equipment be recovered as quickly as possible for reinvestment, further improvement, and growth," he says.

"Presently, capital recovery in the U. S. is the slowest of any industrial country in the world. It takes 12 to 30 years to recover capital invested in machine tools in the U. S., as opposed to four to eight years in the industrial countries of Europe," he says.

Mr. Cross also calls for government tax reform to stimulate capital investment and for an end to union "makework and featherbedding practices." "There are no automatic factories on the horizon to eliminate the need for people. Industry still needs a fair day's work for a fair day's pay," he concludes.

Ralph E. Cross, executive vice president of Cross Co., Detroit, warns against an overseas exodus of U. S. plants, capital

Case Meets Import Threat

J. I. Case Co., Racine, Wis., will introduce a line of small diesel tractors this winter which "will more than compete in price with most of the small diesel tractors being imported from Europe."

Marc B. Rojtman, president of the tractor company, says: "The recent imports of small diesel farm tractors from Great Britain, Germany, and other European countries, at prices much lower than American industry could match, created a serious problem for Case and companies like us."

Case will also build the same tractor in its French facilities for sale in the European Common Market.

New Ship Terminal Planned

Construction of an $8 million to $10 million ship and barge terminal will begin in Chicago next spring. Being built by the newly formed Ocean-River Terminals Inc., the facility is to be completed by the beginning of the 1961 shipping season. Location: A 25 acre site on the north side of the Calumet River, ½ mile east of the Calumet Harbor entrance.

Three large ocean or lake ships will be able to simultaneously load or unload along the terminal's proposed 2000 ft dock. The barge dock is to feature an overhanging roof, permitting the handling of bulk materials in any kind of weather. Tanks will be available for liquid storage.

Interstate Roads Grow

Construction contracts for 238 new miles of the national system of interstate highways were awarded during May. Estimated cost: $144 million. Also authorized in May were preliminary engineering contracts worth $5 million, and right of way acquisitions costing $43 million.

U. S. Department of Commerce figures show completed construction for the month totaled 122 miles, costing $91 million. As of May 31, $3.21 billion worth of construction

was underway on 5154 miles of the interstate system. New contracts authorized the building of 237 bridges, while completed construction included 188 bridges.

Construction contracts for the ABC program of improvements to federal aid highways were awarded on 2683 miles, including 357 bridges, at a cost of $133 million. Contracts were completed in May on 857 miles of these systems at a cost of $81 million.

In the special speedup and full-employment program based on federal aid "D" funds, construction as of May 31 was underway on 7642 miles and 976 bridges, estimated to cost $499 million.

N. Dakota Seeks Industry

North Dakota, essentially an agricultural state, is making a drive for industrial development so it can diversify its economy. Leaders from the state recently met with industrial and financial people in New York.

Potentials are based primarily on the state's large deposits of lignite (around 350 billion tons, or 75 per cent of the known reserves in this country and 41 per cent of the world figure).

Because of lignite's abundance and low cost (it lies in seams near the surface and can be cheaply obtained by stripping), it is well suited for use in the production of low cost heat and power. It also holds great potential as a source of basic raw material for the chemical industry.

• **Other Selling Points**—North Dakota has newly developed resources in oil and gas, various types of salts, and an abundant water supply.

Aluminum is cited as an example of how heavy industry might be developed in the state—through the availability of low cost fuel, auxiliary hydroelectric power, and certain advantages in transportation costs. For example, the opening of the St. Lawrence Seaway makes Duluth a seaport which is only some 250 miles away.

Added incentive: The financial condition of the state is said to be sound.

Titanium Has Future In Air Weapons Use

THE APPLICATION of titanium in air weapons will increase slowly but steadily in the foreseeable future, concludes the Defense Materials Information Center after surveying 80 aircraft companies and government agencies.

Per unit usage as a percentage of structure weight in airframes is predicted to rise from 2 per cent in 1961 to 9 per cent in 1968 (24 per cent is termed possible). In engines, the jump should be from 4 to 9 per cent (11 per cent is termed possible).

• **Uses**—The metal is established as a useful member of the aircraft structural materials family. Selection of its alloys for airframe parts in original design is becoming more frequent.

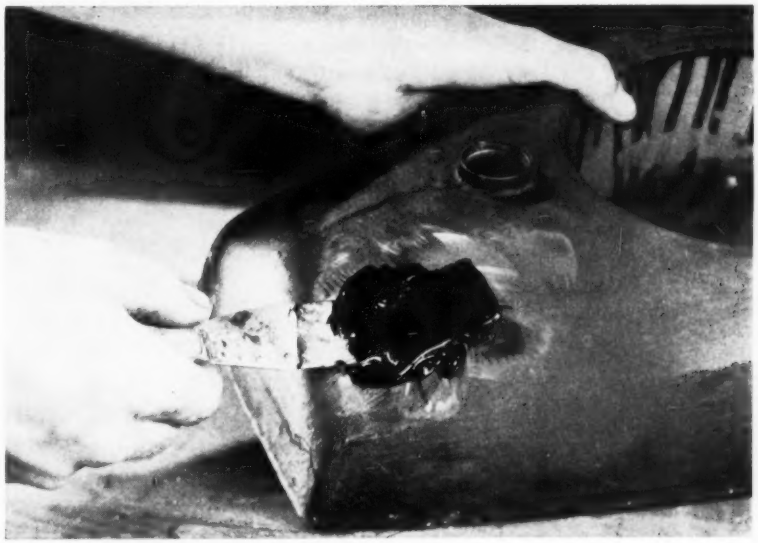
Titanium is expected to become increasingly useful in low power, high efficiency aircraft gas turbines. The metal will have fewer applications in powerplants (except solid propellent) in Mach 3 and above designs. Reason: The operating temperature of many of these engines is above the metal's range. It will be used more as a weight saving substitute for steel and as a performance increasing substitute for lighter metals in new engines of less than Mach 3 performance.

• **Stumbling Blocks**—Uses in missiles are not clearly resolved. Consumption will not be great until two developments come about: 1. Demonstration of marked superiority of titanium alloys over steel in solid propellent rocket motor cases of high performance. 2. A big reduction in the price of high strength titanium alloy sheets of reasonable weldability.

Desired performance will probably come (at least in a limited way) soon enough for some application in the solid propellent missiles now under development. Costs are coming down and should continue to fall.

High temperature is not yet a significant deterrent to extensive usage. Only one or two of the airframes now contemplated are too hot for the metal. Considerable portions of Mach 3 to 4 air breathing engines will be below its maximum service temperature.

More data are needed. The future of titanium will depend greatly on difficult and expensive development work.



REPAIRING HOLES AND DENTS is said to be a lot easier with a new combination of aluminum powder and epoxy resin. The material is mixed on the spot and spread on the preheated area with a putty knife. A few minutes of curing with a heat lamp readies the soldered area for sanding and painting, says Co-Polymer Chemicals Inc., Livonia, Mich.

Vice President Nixon will check answers . . .

Can U.S. Keep Prices Stable?

THINKING of raising prices this summer? Vice President Richard Nixon will be among those looking over your shoulder to see if your action is "inflationary." He is chairman of the President's "Committee on Price Stability for Economic Growth," which includes members of the cabinet, Allen Wallis of the University of Chicago, and Raymond Saulnier, chairman of the President's Council of Economic Advisers.

In its first report, the group warns that the nation is at a critical crossroad: One way leads to inflation, the other to making price stability an explicit goal of the federal government's economic policy. The President has already asked Congress to revise the Employment Act to include a reference to stable prices, but the amendment is bogged down in controversy among economists as to whether full employment and stable prices are compatible goals. Some have argued we must be prepared to accept an unemployment rate of 5 per cent of the working force if we are to hold the price line.

Looking straight at the steel negotiations in New York (Page 39), Mr. Nixon's group comments that settlements this year could bring "wage increases of such magnitude as to lead to price increases."

Nixon Rejects Price Controls

If this concern about inflation smacks of direct government price controls to you, listen to this part of the report: Price ceilings would hurt the economy more "than any amount of inflation that we have ever experienced or are likely to experience in peacetime." The committee agrees with most industrialists that price controls lead to wage controls, rationing, and finally, job regulation.

The group also rejects the much abused theory that a little bit of inflation is not necessarily a bad thing. How then is Uncle Sam to keep prices stable? The group will issue further reports. One will probably consider antitrust action against labor and business monopolies; another will look into ways to break bargaining units into smaller pieces so single settlements will have less widespread results.

Democrats React Quickly

Counting the Nixon report as a move to advance the vice president's Presidential hopes in 1960, Democrats in Congress quickly sounded off last week: "Being against inflation is much like being against sin," noted Senate Majority Leader Lyndon Johnson (D., Tex.), himself a leading contender for the 1960 race.

Supreme Court Needles Security Program

Security risks among the 3 million defense workers of the nation will receive the right to confront their accusers as a result of the Supreme Court's action last week in the case of William Greene. He was denied clearance in 1953, then fired by his employer. The court ruled the government's security program had never been authorized by Presidential executive order or law. It stated the security program can be re-established if it squares with our traditional ideas of fair procedure.

Value Analysis Contracts Set by Navy

Sign of the times in military procurement: The Navy has signed a "value analysis" amendment to its $62 million contract with McDonnell Aircraft Corp. for F4H fighters. "The amendment is expected to establish a pattern for other value analysis contracts to follow," says the Bureau of Aeronautics. Under the program, cost reduction measures recommended by the contractor will be screened by the bureau's value analysis committee. The special province of the committee is establishing realistic operational requirements, simpler specifications, and a reduction in paperwork.

Compromise Ahead for Road Financing?

Talk that Congress may boost gasoline taxes (but not as much as the President requested) is making the rounds on Capitol Hill. The boost would probably be restricted to one year, with the idea that an extension could be carried next year while the whole problem of federal highway financing is restudied. At this point, chances for the proposal are still slight, but more Democratic congressmen are resisting the "spendthrift" tag that Ike is branding them with.

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'50s Top '20s on Investment Return

CORPORATE INCOME produced in this decade has been higher relative to investment than it was in the 1920s, reports the Machinery & Allied Products Institute, Washington. The association's study of corporate profits also reveals that postwar profits have been exaggerated both absolutely and relative to profits in the 1920s. Pretax profits in the 1950s have been slightly higher in relation to income produced. But after tax, they have been much lower. Pretax profits have represented a greater margin on adjusted net worth. After tax, they were about the same.

• **Comparison Chosen**—To find out how corporate profits and rates of return have been running in recent years, the decade of the 1920s was chosen as the comparative period. Reason: It is the most recent era of sustained peacetime prosperity.

• **Adjustments Needed** — Various adjustments were necessary to make the two periods more directly comparable. Fluctuating factors: Tax depreciation methods and inflation.

Tax depreciation was adjusted by recomputing postwar profits as if the straight line method (almost universal in the 1920s) had been used exclusively. Use of this method was for convenience and does not infer it is the best measure of capital consumption.

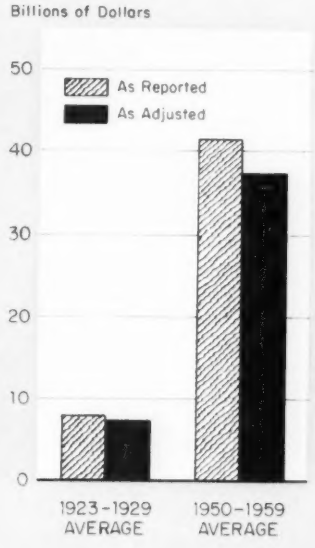
To eliminate the unequal impact of inflation on reported profits, the current-dollar equivalent of the historical cost of inventory and fixed assets consumed in production has been substituted (fixed asset consumption being reckoned by straight line depreciation).

• **Terms Defined**—Reported profits (those reported by the Department of Commerce) are generally on an income tax basis. They exclude capital gains and losses and intercorporate dividends, but include depletion allowances.

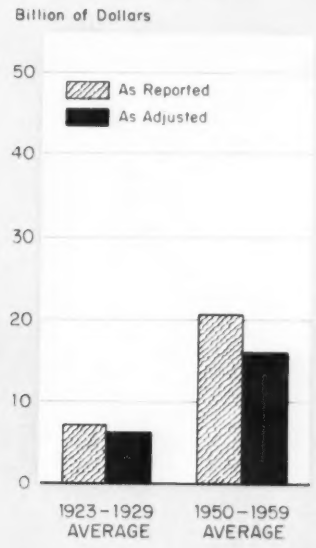
Income produced in the sum of employees' compensation, pretax profits, and net interest payments.

MAPI Study Shows Profits of '50s Overstated . . .

Corporate profits before tax. Reported and adjusted profits were close in the 1920s, show gap in the 1950s

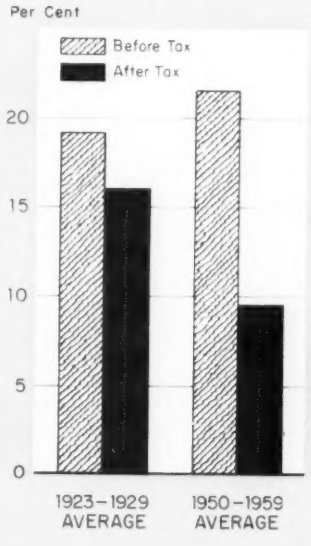


Corporate profits after tax. Same trend as before tax. When adjusted to comparable basis, the increase is exaggerated

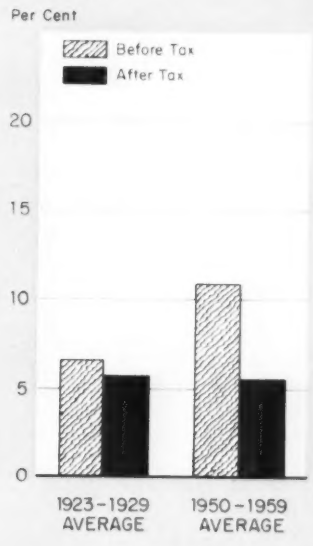


Up Before Tax, Down After, Higher Per Net Worth

Adjusted corporate profits before and after tax as a percentage of adjusted corporate income. Higher profits in the 1950s before tax, drastically lower after tax



Adjusted corporate profits before and after tax as a percentage of net worth. More income per dollar of net worth today than three decades ago



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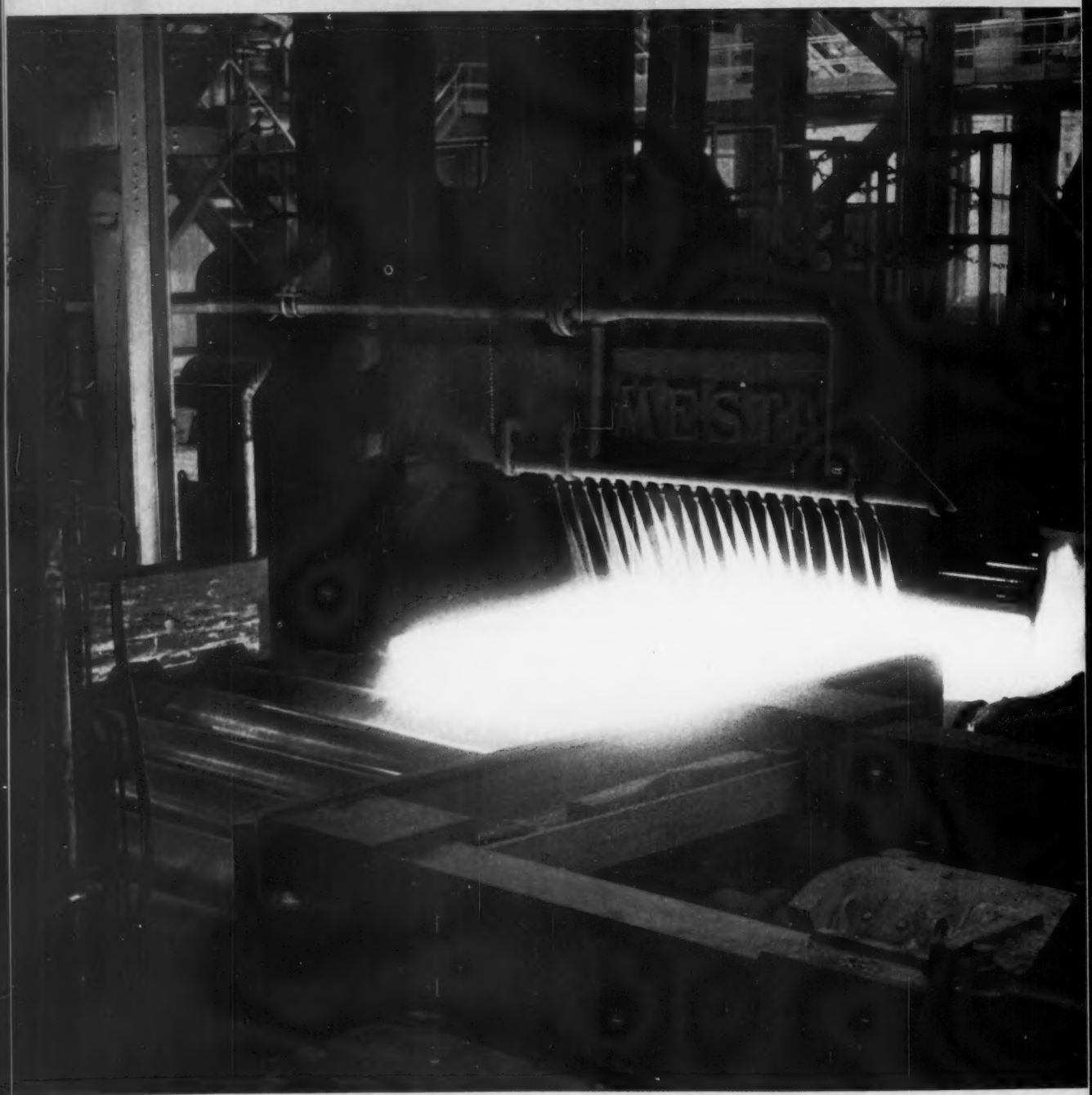
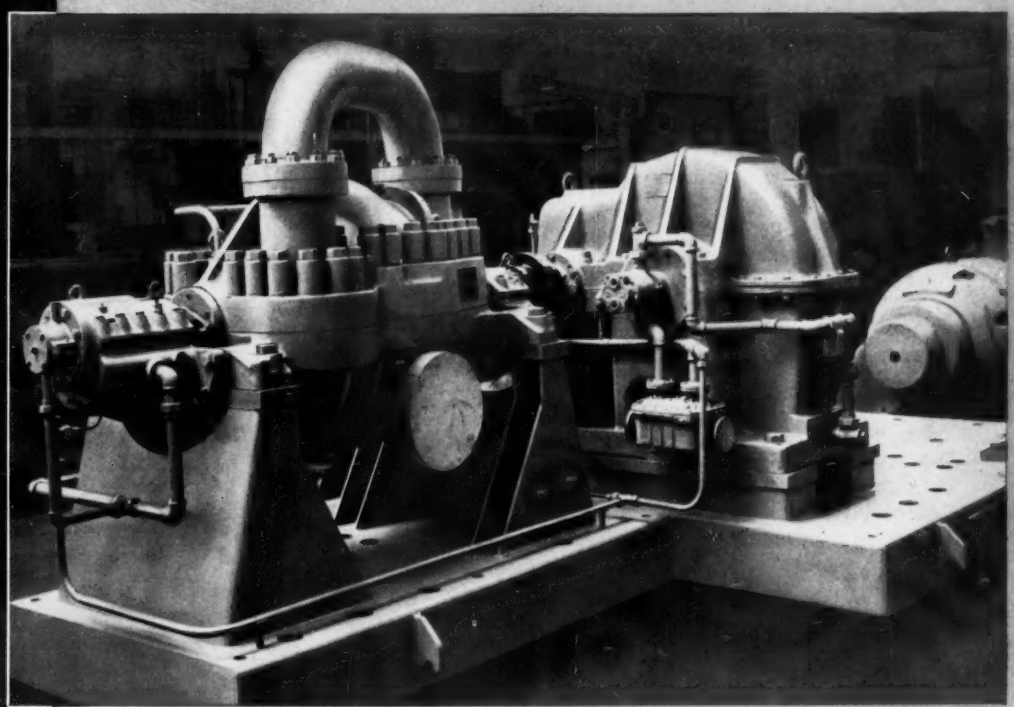


descaling at Lukens Steel

Latest successful technique of high-pressure descaling is now being performed in this modern steelmaking facility designed by Mesta Machine Co.

The initial high-pressure descaling operation uses De Laval split-case multi-stage pumps as shown in the photograph below. Each pump supplies cold water at 1000 gpm and 1600 psig. Electric motors rated at 1750 hp drive the pumps through speed increasers which raise the speed from 1200 rpm to 4250 rpm.

De Laval pumps also serve Lukens on a 1200 psig descaling system in another section of the Coatesville, Pa. mill.



One of several arrangements available for descaling service at pressures of 1000-1200-1600 psig and capacities to 2200 gpm.

DE LAVAL *Steam Turbine Company*

860 NOTTINGHAM WAY, TRENTON 2, NEW JERSEY

[84490]

Construction Builds Equipment Sales

Construction machinery and equipment head for second best year in terms of production value—given below in billions:

1959	$2.2*
1958	$1.9
1957	$1.8
1956	$2.4

Problem: Too much depends on the government highway program.

Source: Business and Defense Services Administration.
*Estimated.

Austin-Western Works.

THE VALUE of construction machinery and equipment production may reach $2.2 billion this year, a total second only to 1956's. (The industry's 600 manufacturers have an annual capacity of $2.8 billion.) Two things stand in the way: 1. If the present session of Congress fails to provide adequate financing for the 41,000 mile interstate highway program, the prediction will be upset. 2. Some states are not implementing tax revenue programs that would provide money to match increased funds authorized by the federal government.

But the outlook for 1959 and 1960 is bright, observes G. A. Gilbertson, president, Construction Industry Manufacturers Association, Chicago, the manufacturers' division of American Road Builders Association. Mr. Gilbertson points out that construction activity is expected to reach a record $72 billion this year (including maintenance). Total new construction in 1958 was $48.9 billion, say the Departments of Commerce and Labor. Maintenance accounted for another $18.6 billion. In the first five months of this year, new construction was 13 per cent ahead of the pace in the like '58 period. If that rate holds, it will hit a record $54 billion. The $72 billion over-all figure assumes maintenance will again be about $18 billion this year.

• **Inventories Normal**—Mr. Gilbertson, who is president of Frank G. Hough Co., Libertyville, Ill., says inventories at both the factories and retail distributors are at normal levels. In most cases, factory backlogs are sufficient to maintain economical production planning. Here's how he estimates the present uses of construction machinery and equipment: Highway construction, 38 per cent; industrial and private building, dams, 27 per cent; mining and quarrying, 21 per cent; agriculture, 10 per cent; military, logging, petroleum, and material handling, the balance.

Sharing the optimism is Louis W. Prentiss, executive vice president, American Road Builders Association, who states: "The Bureau of Public Roads estimates that $633 million worth of highway construction equipment will be sold in 1959. The figure includes motor vehicles. Sales of $300 million are estimated in maintenance equipment."

• **Makers Enthusiastic** — International Harvester Co., Chicago, looks for industry sales to be about 23 per cent over 1958's. David A. Milligan, vice president, J. I. Case Co., Racine, Wis., reveals that April was the biggest in its industrial division's history. Sales exceeded last April's by over 50 per cent. Retail volume for the first six months is about one-third ahead of what it was in the like 1958 period.

R. S. Stevenson, president, Allis-Chalmers Mfg. Co., Milwaukee, recently observed that the tone of construction machinery retail sales is good. Sales of Caterpillar Tractor Co., Peoria, Ill., for the first five months of this year were 42 per cent above those in 1958's corresponding period.

William A. Hewitt, president, Deere & Co., Moline, Ill., reports his firm's sales of light industrial tractors and equipment will show about a 50 per cent increase in the first half over those in the same period a year ago. Oliver Corp., Chicago, reports its sales of industrial products were better in the second quarter than they were at this time last year.

Austin-Western Works, Construction Equipment Div., Baldwin-Lima-Hamilton Corp., Aurora, Ill.,

is most optimistic over construction equipment prospects during the next ten years. C. M. Lippincott, vice president, bases his cheer on the needs of the road building program and construction in general. But he believes the upward trend may level off in the midsixties. Koehring Co., Milwaukee, also sees continued gains in the next decade but expects some temporary setbacks like those in 1957 and 1958. E. H. Holt, vice president and director of sales, Barber-Greene Co., Aurora, Ill., thinks business in the 1960s will be 14 to 20 per cent better than 1958's if government funds to continue the highway program on schedule are provided by Congress.

• **Expansion vs. Replacement**—Opinions differ as to which provides the bulk of sales. The type of equipment has considerable bearing. James C. Jay, executive vice president and general manager, Safway Steel Products Inc., Milwaukee, thinks expansion motivates the sales of his products (scaffolding, material handling and work towers, and stages). Alvin E. York, sales manager, Construction Machinery Div., Clark Equipment Co., Benton Harbor, Mich., believes the largest share of equipment purchases seems to be for replacement—as borne out by trade-ins (his firm makes excavator cranes and tractor shovels). But he observes a sizable element of expansion in the earth-moving field.

• **Prices**—The industry has generally increased prices this year, although you hear some rumors of price cutting. Credit is no stumbling block, but it could be if financial interests tighten up. In a number of cases, manufacturers have their own credit organizations.

• **Problems**—Indiscriminate dumping of government military surplus would create an unfavorable impact on the industry. Excessive trade-in allowances cause some trouble.

• **Leasing Still Gaining** — Larger firms find it attractive for tax purposes, while smaller users sometimes find it advantageous because of the smaller initial outlay. But it is pointed out that if accelerated depreciation of a realistic nature is allowed, leasing may decline.

Farm Paradox Spells Bigger Markets

Fewer People Live on Farms . . .

31 million in 1939

21 million in 1959

There Are Fewer Farms . . .

6.5 million in 1939

4.7 million in 1959

But the Farm Is a Bigger Market . . .

Farmers spent $11.5 billion in 1939

They'll spend about $40 billion in '59

The Average Farmer Buys More . . .

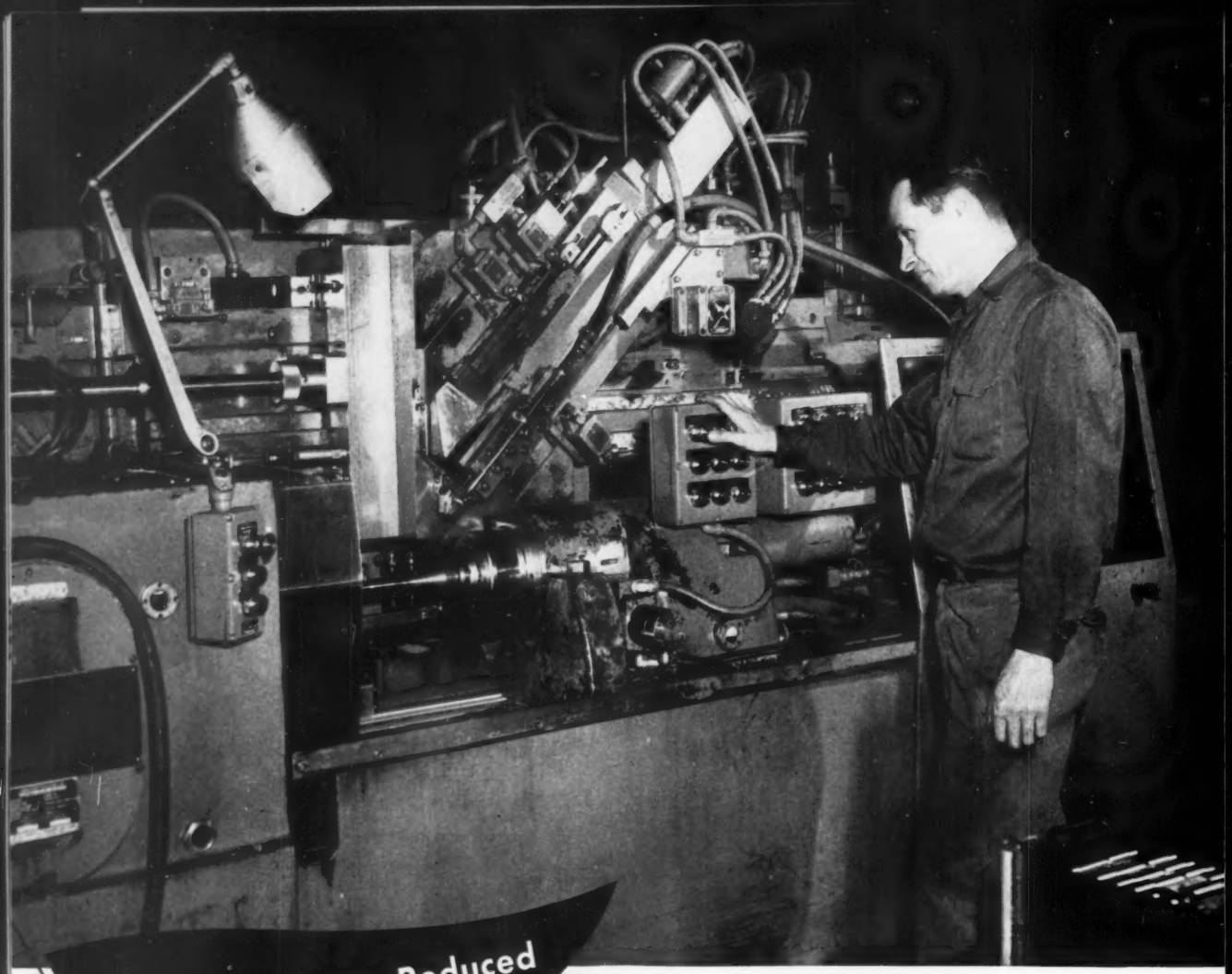
He spent about $1800 in 1939

He'll spend about $8500 in '59

Here's Where the Money Goes . . .

	Total (Millions of dollars)		Per farm (Dollars)	
	1937-41 average	1958	1937-41 average	1958
Total production expenditures	6,329	24,267	981	5,110
Feed, livestock, seed, fertilizer, lime	1,783	8,735	277	1,839
Hired labor	1,047	2,981	162	628
Repair & operation of farm capital items	824	3,590	128	756
Property taxes, interest, rent	1,197	2,938	185	618
Capital expenditures	772	3,574	120	753
Service buildings & other structures	104	834	16	176
Automobiles	115	400	18	84
Trucks	83	497	13	105
Tractors	204	570	32	120
Other machinery & equipment	266	1,273	41	268

Source: National Industrial Conference Board.



Machining Time Reduced Over **25%**

on Valve Bodies with . . . . . .

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HYDRA-FEED LATHE

This "dollars and cents" saving is made possible, according to the National Supply Company, Toledo, Ohio, manufacturers and distributors of oil field equipment and supplies, for the following reasons: Minimum set-up time; Rugged construction; Ease of operation and Flexibility of feed rates.

Further, they are completely satisfied with the Bullard Hydra-Feed and, if ordering another machine for the same job, would consider purchasing another Bullard Hydra-Feed Lathe.

You, too, will share this enthusiasm for the Bullard Hydra-Feed Lathe — ask your Bullard Sales Engineer, Distributor or write for full information to

THE BULLARD COMPANY

BRIDGEPORT 9, CONN.

Look for 37 Per Cent Jump in Truck Output This Year . . .

	1959* TOTAL	1958 TOTAL
	1,199,434	**871,330**
1st quarter	308,590	227,858
2nd quarter	350,844	218,359
3rd quarter	230,000	164,640
4th quarter	310,000	260,473

* Last two quarters are projected.
Adapted from *Ward's Automotive Reports.*

DOMESTIC truck builders are aiming at a 1.2 million market this year, which would be one of the best years since 1951 when production of 1.4 million trucks set a record.

Light trucks under 6000 lb continue to account for 50 per cent of total sales. The 16,000 to 18,000 lb rigs are cutting further into the next lowest weight class.

• **Output High**—The second quarter of the year has turned out to be a near record. About 350,000 trucks were completed. Sales will come close to that level. The previous record quarters were 1955 (378,000) and 1951 (408,000). GMC Truck & Coach Div., Pontiac, Mich., indicates sales are running better than 30 per cent ahead of last year's. Philip J. Monaghan, GMC's general manager, says: "Sales and orders are steadily increasing."

White Motor Co., Cleveland, says first half sales are $172 million compared with $125.2 million a year ago. White looks for annual sales of $320 million, up 19 per cent from '58. So far, the heavy duty builder has turned out 13,250 units against 10,074 in the first half of last year. Some 145 of its newly introduced glass fiber cab bodies have been completed; another 500 orders are backlogged. White has a 90 day inventory on components and materials. It anticipates no problem in getting enough steel to handle its growing production volume.

Both Ford and Chevrolet are enjoying an increase in sales this year. Sales of Chevy trucks are about 38 per cent ahead of those a year ago. Ford, with a broader lineup, is showing a 45 per cent increase.

• **Diesels Gain** — Biggest shift in trucks is the increasing emphasis on diesels. Sales are 30 per cent ahead of last year's. Look for 30,000 to be turned out this year—a record. Even in last year's slump, 25,172 units were built, almost equal to the previous high of 25,797 set in 1956.

Truckers say increases in defense contracts and in heavy duty sales, plus easing of weight and size restrictions which permit more cross-country travel, are key reasons for the increase in diesel output. Another reason, cited elsewhere: Development of more economical engines.

Heavy duty trucks, which account for about 40 per cent of the diesel market, show a 20 per cent sales increase this year. The extra heavy jobs (33,000 lb or more) show almost a 50 per cent market gain. Over a third of these are dieselized.

More diesels will be introduced in 1960. Dodge plans to enter the heavy duty market next year with three basic models powered by four sizes of Cummins diesels. Cummins supplies about two thirds of total U. S. diesel requirements. The Dodge trucks will range from 27,000 to 53,000 lb, gross vehicle weight. Combination weights will be 15 per cent greater than on present models.

Ford is expected to be another newcomer. The story is that a series will be introduced this fall.

• **Imports**—The other area of in-

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creasing penetration is import sales which are running about 4 per cent of the total domestic truck market. In 1955, only 1310 trucks and buses were imported, says the Automobile Manufacturers Association. Last year, this figure had climbed to 15,330. At the same time, exports declined from 175,791 in 1955 to 147,598 last year. Early reports on exports indicate this slide has been slowed in 1959, but the industry sees little reason for exports to increase over the next several years.

Most of the imports are the Volkswagen vans, although French and Italian makers are beginning to show more market strength. Domestic producers are preparing to do battle. Divco-Wayne Corp.'s bantam bus is in production. These small buses can seat 12 to 25 persons. They range from 10 to 14.5 ft in length. International-Harvester Co.'s small van line is picking up more sales. Company sources say it may account for 6 per cent of I-H's 1959 output. Chevrolet is preparing a smaller van type truck. The GM division has been building up a Volkswagen Minibus to see how VW does it and to check manufacturing costs.

Studebaker-Packard Corp. will introduce a Ranchero-type truck this fall. Ford Ranchero sales are 29.3 per cent ahead of those a year ago.

• **Trucktrailers**—Shipments are up 55.7 per cent in the first four months of 1959 over 1958 (21,298 units vs. 13,683).

Re: GM's 2nd Small Car

GM's Buick-Olds-Pontiac Div. is continuing its program to design a second small car for the General Motors lines. The company has not yet committed itself to the B-O-P job, but engineering is well advanced. The car will have a wheelbase between 112 and 114 in. It will weigh about 2800 lb, say STEEL sources. Powerplants will be two aluminum V-8, water cooled engines of 185 and 220 hp. Buick Div. reportedly will use a three speed Trans-axle in the car. It is not known if Pontiac and Oldsmobile will also use a Trans-axle.

Perhaps the most interesting feature of this car is that the entire dash panel has been designed as a single aluminum diecasting.

It's supposed to be cast in a 1200 ton press. The panel is roughly 2 ft deep, 1 ft thick and between 5 and 6 ft long. Parts of it will be painted, but it's expected other sections will be plated. The work will be done in a GM division plant, probably in one of Central Foundry Div.'s Fabricast facilities. The B-O-P job tentatively is slated for 1961 introduction.

Meanwhile, Chevrolet has been having more preproduction problems with its light car, Corvair. GM's Fisher Body plant in Grand Rapids, Mich., has been fabricating some of the Corvair's underbody sections and STEEL's informants claim the division is having a serious problem keeping body welds from cracking on the galvanized sections. So far no practical solution has been worked out.

New Transmission Planned

Curtiss-Wright Corp. will introduce a new type automatic transmission, called traction drive. It will be announced in September and will be available for automotive use sometime in the 1960 model year.

The inventor, Charles E. Kraus, says the transmission differs from present automatic jobs in that the discs in the gear box are mounted loosely in liquid instead of being in fixed positions. Mr. Kraus says he's tested the unit for two years in the University of Rochester's mechanical engineering department. Curtiss-Wright has purchased manufacturing and sales rights from Mr. Kraus on a royalty basis. The inventor has been retained by the company to head up a crash development program.

U. S. Auto Output

Passenger Only

	1959	1958
January	545,757	489,515
February	478,484	392,132
March	576,085	357,048
April	578,825	316,594
May	546,817	349,613
June	564,000	337,446
6 Mo. Totals	3,289,968	2,242,348
July		321,017
August		180,447
September		130,460
October		261,701
November		514,152
December		593,920
Total		4,244,045

Week Ended	1959	1958
May 30	117,372	66,844
June 6	125,186	73,696
June 13	127,029	78,163
June 20	129,270	84,396
June 27	130,001†	92,277
July 4	115,000*	35,273

Source: *Ward's Automotive Reports.*
†Preliminary. *Estimated by STEEL.

Ford to Make Mutt

Ford Motor Co. has been awarded a $15 million Army contract to produce 4050 ¼-ton passenger and cargo carrying vehicles which ultimately are expected to replace the Army's Jeeps. Nicknamed Mutt, the vehicle is about 400 lb lighter. It can be rigged for air drops and gives 30 per cent more cruising range on the same fuel load as the Jeep. It's 6 in. shorter, but provides 26 per cent more cargo space.

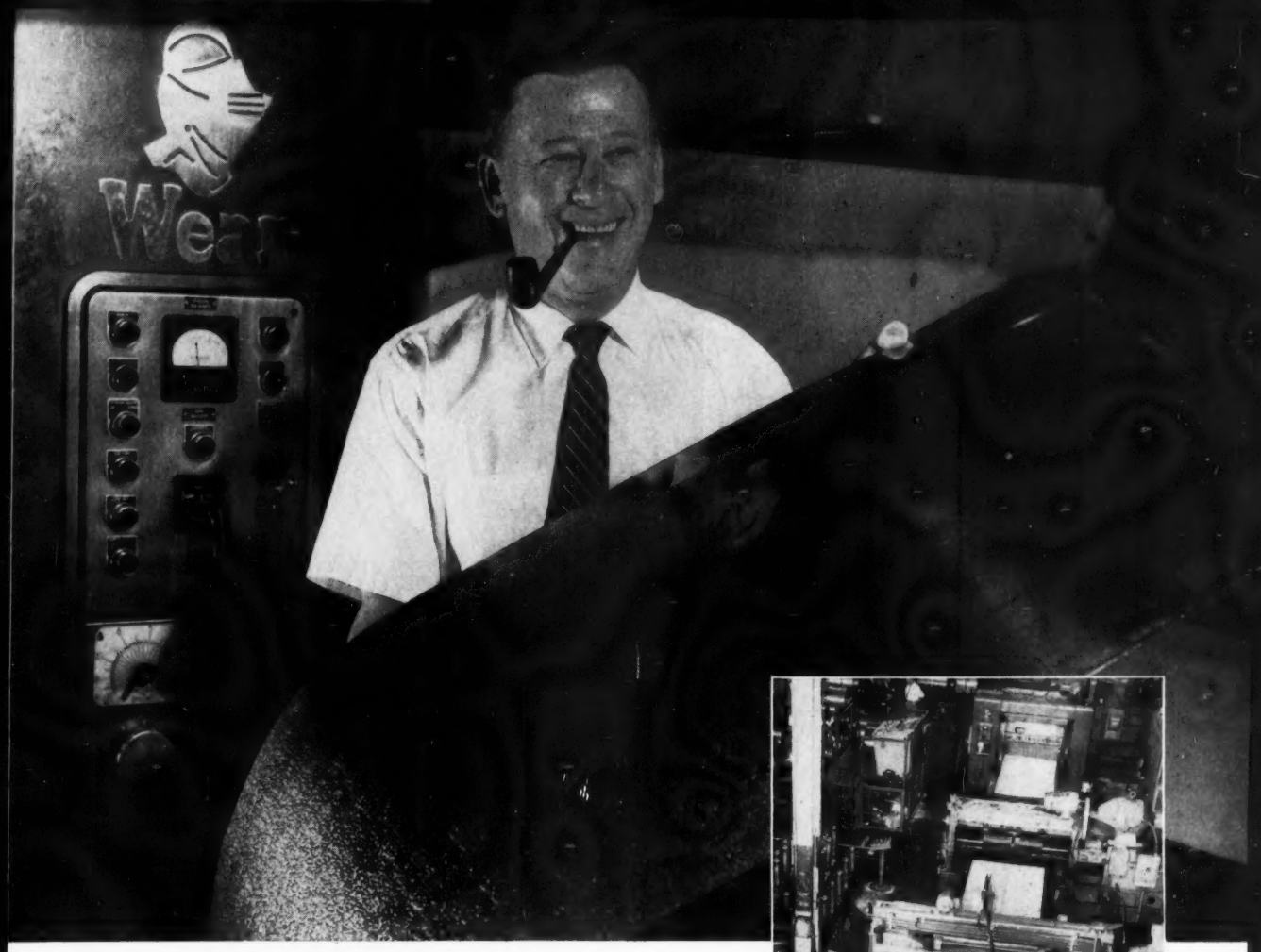
Mutts will have steel unitized bodies, independent suspension, interchangeable front and rear axles, and a four cylinder engine that weighs only 247 lb. About 85 per cent of the service parts are designed for interchangeability with a fleet concept of trucks still to be developed. The vehicles will be built in Ford's Livonia, Mich., facilities. About 60 per cent of the subcontract work goes to Michigan firms. First models are due off the line in March, 1960.

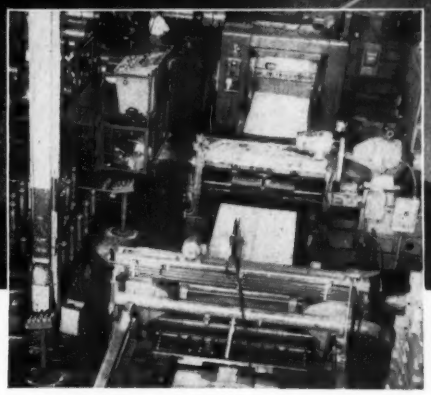
Ford Absorbs Subsidiary

Ford Motor Co. is merging Aeronutronic Systems Inc., Glendale, Calif., a subsidiary, with the parent company. Ford owns over 90 per cent of the subsidiary's stock.

Aeronutronics is engaged in advanced Space Age research and development programs, primarily in instrumentation and range systems. It's working on more than 30 prime government contracts, including a $23 million development program for the Shillelagh surface-to-surface guided missile system.

Last year, the company moved from 132nd to 48th place among the top 500 Department of Defense contractors in terms of net value of awards.





Edward N. Sienko, Manager of Special Products, tells how:

"Custom service and Wean coil processing are helping Sun Steel beat cost squeeze"

That's a sheet of partially embossed stainless Mr. Sienko is holding—and it's part of the story on how Chicago's Sun Steel Company is countering the cost squeeze on steel warehousing operations.

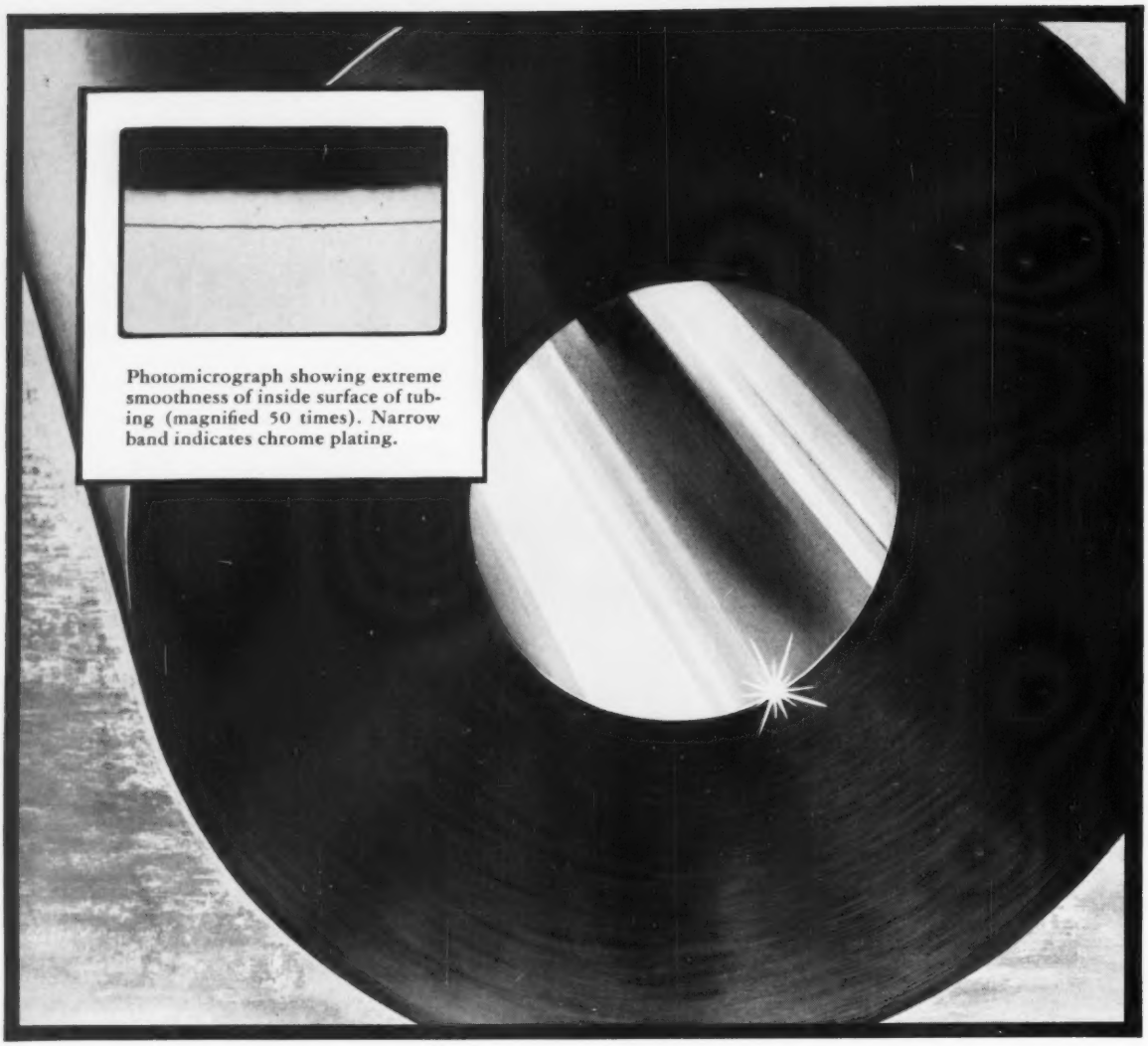
As Mr. Sienko states it, "Today our margin on materials is half what it was 15 years ago but our man-hour costs are more than double." Sun's answer: add specialty products to better serve customers—such as vinyl-coated steel, embossed stainless and aluminum sheet—and cut costs by installing a Wean coil processing line.

The Wean "Flying Press" line enables Sun to stock standard coils—with savings in cost, handling and inventory—yet meet customer requirements for prime sheet quickly and efficiently. As Mr. Sienko puts it, "To provide this custom service, we need modern equipment like the Wean 'Flying Press' line: we'd be lost without it."

If your firm uses sheet stock in quantity, you should explore the possible economies of coil processing. Write or call for an appointment with an experienced Wean sales engineer: it may be the most important step you'll take this year in the battle against costs.

WEAN EQUIPMENT CORPORATION
CLEVELAND 17, OHIO
Detroit • Chicago • Newark

WEAN



Photomicrograph showing extreme smoothness of inside surface of tubing (magnified 50 times). Narrow band indicates chrome plating.

How to beat fatigue

caused by pulsating pressures up to 50,000 psi

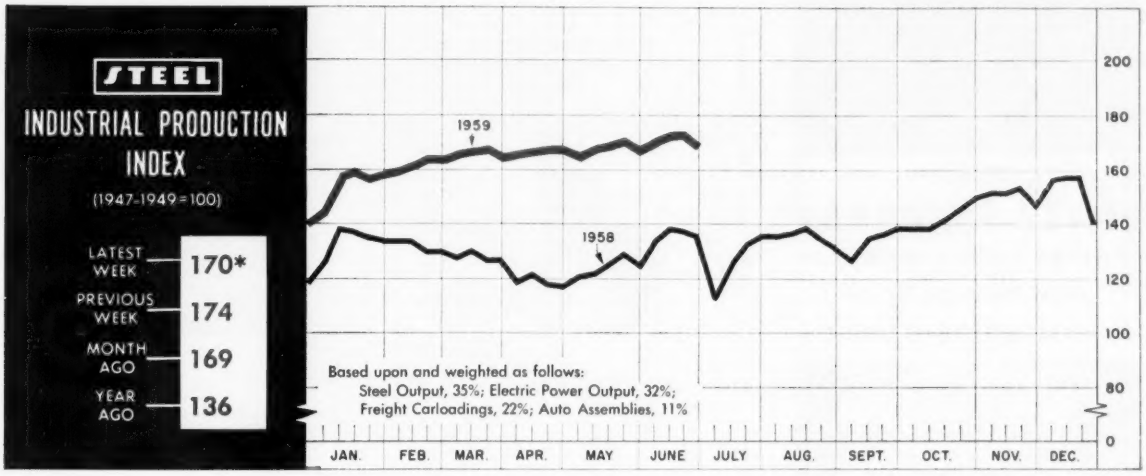
PROBLEM: Manufacturers of polyethylene plastic were plagued by *costly* fatigue failures in the heavy wall, high pressure steel tubing they were using. *Result:* Costly, frequent replacements with attendant production and time losses.

CAUSE: The tubing's inside surface had slight, almost invisible imperfections which gave the pulsating pressures—varying between 35,000 and 50,000 psi—a toe hold for failures to start.

SOLUTION: Timken Company metallurgists recommended a specific low-alloy steel tubing that could be produced with a glossy-smooth interior surface. They used specially developed Timken Company processing techniques, based on more than 40 years of experience with all types of high pressure steel applications. Result—another special steel problem solved.

WHATEVER your special steel problem, it will pay you to use the experience of the experts—metallurgists of the Timken Company. Give us a call the next time you need help. The Timken Roller Bearing Company, Steel & Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

TIMKEN® *Fine Alloy* STEEL



*Week ended June 27.

Building to Sustain Summer Economy

THIS SUMMER, as in most since World War II, the construction industry will be one of the mainstays of the economy despite scattered signs of weakening.

The industry has just finished marking up one of the biggest first halfs in history, both in terms of work put in place and in contracts for future construction. The only doubt about the second half is whether the industry can maintain its pace for new contracts. Jobs already on the books guarantee another record for work put in place.

• **Key Element**—So far in 1959, housing has been the bulwark of the industry. Through the first five months, new starts were at an annual rate of 1,377,000 units. If the pace is maintained, this would be the best year ever for home builders. However, some observers feel the market is beginning to falter. Starts in May declined 3000 units from April's figure, which is contrary to the seasonal pattern. But with two exceptions (May, 1950 and 1955) it was the best May on record.

Builders believe that the trend will continue upward during the rest of the year. While there are qualms about financing, 500 builders surveyed by the National Association of Home Builders plan to increase starts 42 per cent over the rate of 1958's second half. In view of the sharp upturn in last year's period, it is likely that the second half will equal or exceed the first half, resulting in a record for the year.

• **Factories Going Up** — If there should be a decline in housing, industrial building could pick up the slack later this year. Contracts for manufacturing buildings have begun to increase, and most industry spokesmen feel the trend is bound to continue as long as the general economic outlook remains firm. Dr. George Cline Smith, vice president and economist for F. W. Dodge

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	2,378[1]	2,486	1,376
Electric Power Distributed (million kw-hr)	13,100[1]	13,331	11,757
Bituminous Coal Output (1,000 tons)	9,265[1]	9,035	8,873
Crude Oil Production (daily avg—1,000 bbl)	7,000[1]	7,017	6,373
Construction Volume (*ENR*—millions)	$491.9	$546.1	$483.1
Auto, Truck Output, U. S., Canada (*Ward's*)	167,615[1]	167,438	118,320
TRADE			
Freight Carloadings (1,000 Cars)	724[1]	720	627
Business Failures (Dun & Bradstreet)	267	295	290
Currency in Circulation (millions)[3]	$31,814	$31,877	$30,973
Dept. Store Sales (changes from year ago)[3]	+22%	+3%	−9%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$25,714	$27,391	$27,667
Federal Gross Debt (billions)	$284.6	$286.3	$276.3
Bond Volume, NYSE (millions)	$26.4	$26.2	$25.1
Stocks Sales, NYSE (thousands of shares)	14,772	13,125	13,334
Loans and Investments (billions)[4]	$95.2	$94.7	$96.0
U. S. Govt. Obligations Held (billions)[4]	$28.1	$28.5	$32.4
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	239.15
STEEL's Nonferrous Metal Price Index[6]	221.8	222.1	197.6
All Commodities[7]	119.6	119.4	119.1
Commodities Other than Farm & Foods[7]	127.9	127.9	125.2

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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makes both conveyors and hydraulic or mechanical presses

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A. B. FARQUHAR DIVISION
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PRODUCTION
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GREY IRON
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ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1855
THE WHELAND COMPANY
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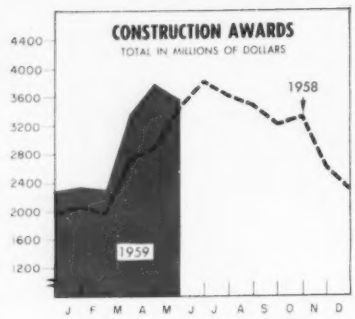
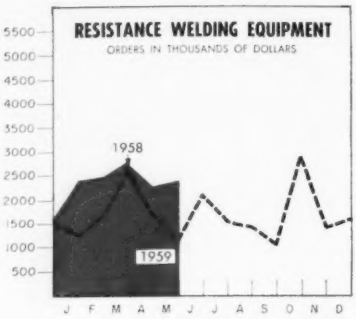
THE BUSINESS TREND



	Total		Building	
	1959	1958	1959	1958
Jan.	2,319.2	2,060.0	1,839.7	1,530.2
Feb.	2,307.0	1,953.4	1,777.4	1,478.1
Mar.	3,339.9	2,721.2	2,453.9	2,037.7
Apr.	3,778.4	2,881.0	3,018.0	2,198.0
May	3,541.9	3,402.6	2,748.8	2,470.3
June	.....	3,819.6	.....	2,340.3
July	.....	3,607.1	.....	2,633.5
Aug.	.....	3,466.6	.....	2,529.5
Sept.	.....	3,215.9	.....	2,352.5
Oct.	.....	3,309.0	.....	2,549.8
Nov.	.....	2,593.9	.....	1,980.8
Dec.	.....	2,281.9	.....	1,728.6
Totals	.....	35,312.2	.....	25,829.3

F. W. Dodge Corp.
Charts copyright, 1959, STEEL.



	Net Orders		Shipments	
	1958	1958	1959	1958
Jan.	2,396	1,243	1,427	1,422
Feb.	2,457	1,683	1,889	1,615
Mar.	2,811	2,550	2,179	1,659
Apr.	2,258	1,684	2,193	1,963
May	2,407	1,121	2,019	1,750
June	.....	2,113	.....	2,346
July	.....	1,534	.....	2,342
Aug.	.....	1,431	.....	1,419
Sept.	.....	1,060	.....	1,125
Oct.	.....	2,885	.....	1,559
Nov.	.....	1,409	.....	1,102
Dec.	.....	1,554	.....	1,357
Totals	.....	20,258	.....	19,659

Resistance Welder Manufacturers' Assn.

Corp., declares: "Sharp gains in contracts for manufacturing and commercial buildings in the last several months reflect growing business optimism and indicate increased activity in these vital sectors in months ahead." (For construction awards compiled by Dodge, see graph and table above.)

Engineering News - Record, reports private industrial contracts during the first 26 weeks of 1959 are 37 per cent ahead of the year-ago mark. Commercial construction awards are up 11 per cent. Total awards are ahead by 7 per cent, and so far there has been no sign of weakness developing in this statistical series. Weekly awards have been near or above the half million dollar mark in five of the last six weeks.

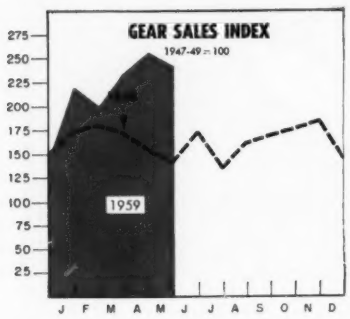
• **Fabricators Off** — Some doubts were cast by the latest report from the American Institute of Steel Construction Inc., which showed that bookings of fabricated structural steel in May dropped to 241,612 tons, the second lowest level of the year. (However, they were still 8 per cent greater than the comparable 1958 figure.)

L. Abbett Post, executive vice president of the institute, feels that the decline was largely the result of uncertainty about the steel situation. "Executives hesitate letting contracts now because they have no assurance of getting the steel to go ahead right away. Once somebody can tell them for sure that steel will be available, though, you'll see more bookings by our industry." Mr. Post feels that the second half will be better than the similar period of 1958.

Shipments of fabricated structural steel still lag the 1958 pace. "Last year at this time, we were still under the influence of the excellent order position of 1956 and 1957," he says. "There is a lag of six months to a year or more between order and shipment, so it is logical to assume that shipments in the second half of this year will begin to reflect the order upturn which came about the turn of the year."

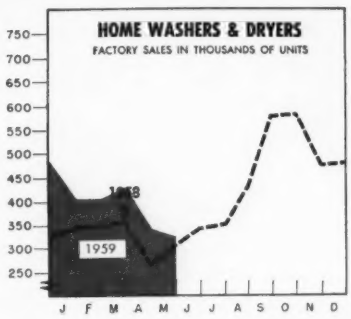
Summer Doldrums Set in

As for industrial production in general, the summer doldrums have set in despite the extension of the negotiations in the steel industry. STEEL's industrial production index has finally come off the record highs that prevailed throughout most of May and June. For the



	1959	1958	1957	1956
Jan.	218.6	174.5	259.3	245.5
Feb.	199.9	179.1	239.5	256.2
Mar.	234.3	173.7	262.4	276.5
Apr.	255.6	153.2	221.7	264.7
May	241.0	142.2	263.2	275.6
June	....	173.8	215.9	245.4
July	....	133.3	211.4	286.7
Aug.	....	162.1	225.8	219.5
Sept.	....	170.7	174.9	230.5
Oct.	....	175.9	207.0	299.8
Nov.	....	182.7	165.3	216.2
Dec.	....	145.5	150.8	235.7
Avg	....	163.9	216.4	254.4

American Gear Mfrs. Assn.



	Washers		Dryers	
	1959	1958	1959	1958
Jan.	288,491	244,840	118,220	100,793
Feb.	297,826	268,143	106,274	79,683
Mar.	329,668	287,884	98,434	71,523
Apr.	274,372	224,896	67,752	38,475
May	277,934	262,999	45,903	41,898
June	.....	288,831	.....	54,173
July	.....	277,287	.....	75,513
Aug.	.....	326,785	.....	109,833
Sept.	.....	423,073	.....	158,733
Oct.	.....	404,056	.....	180,405
Nov.	.....	333,035	.....	142,499
Dec.	.....	330,520	.....	148,670
Totals	.....	3,672,349	.....	1,202,198

American Home Laundry Mfrs. Assn.

week ended June 27, the trend line dropped 4 points to a preliminary 170 per cent of the 1947-49 base period.

Most of the decline is the result of lower operations in the steel industry. In their first week of grace under the contract extension, producers scheduled their furnaces at about 84 per cent of capacity, good for under 2.4 million net tons for ingots and castings. Even if an agreement is reached, this portion of the index will continue to lose strength until the fall upturn occurs.

The other depressant, electrical power production, dipped in the latest week. But this is normal for the week preceding July 4 and does not indicate industrial weakness.

The mainstays of the index are railroad carloadings and auto production. Carloadings, at over 720,000 units, are at the highest level in 20 months. Unless the steelworkers go out, the railroads should enjoy moderately heavy traffic throughout the summer. Auto producers are still riding on high sales and have scheduled over a half million units in July. If they make it, this will be the seventh month out of the last eight to exceed that mark. (February is the exception.)

Later this month, auto producers will begin model changeover shutdowns which will reduce assembly schedules to 256,000 units in August, say *Ward's Automotive Reports*. By September, all makers will have '60 models in the works, and production will be about 300,000 units.

Trends Fore and Aft

• After reaching the best level in history, orders from screw machine products have dropped off two months in a row. The index reached 205 (1947-49 = 100) in May, reports the National Screw Machine Products Association. The shipment index was 200 for the month, exceeding the monthly average for every year but 1953.

• Both orders and shipments for resistance welding equipment continue above the $2 million monthly level, says the Resistance Welder Manufacturers' Association. (See graph and table, Page 62.)

• Despite a decrease of 5.7 per cent, sales of gears in May were the second highest of the year, reports the American Gear Manufacturers Association. (See graph and table above.)

ED JOHNSON
Furnace Application Engineer, reports . . .

SINTERING GOES SCIENTIFIC

The effective bonding of powder metal compacts is dependent on precise sintering temperatures, and the properly reactive furnace atmosphere for each temperature range. To assure optimum results at lowest cost, Hayes offers both the *right* furnace and the *right* atmosphere for any sintering operation, whether you're working with ferrous, nonferrous, or refractory metals; stainless steel compacts; or cermets. Hayes furnaces and atmospheres suitable for research, high-temperature, or production sintering, include:

Type BA-M Pusher "Pilot Plant" Furnace. Controlled atmosphere heating and cooling . . . straight-through design. Manual or automatic operation to 2150° F.

Conveyor Furnaces straight-through LAC and Humpback BAC — for continuous, automatic, sintering to 2100°F. Zone temp control. Burn-off sections. For stainless steel, etc.

Type BA High-Speed Pusher Furnace — wide-temperature-range furnace for sintering to 2350° F. Available with automatic, electro-hydraulic pusher system for constant time / temperature cycles.

Type M-Y High-Temperature Furnace for uniform heating of ceramic and metal compacts at temps over 3000° F. Economical — use with reducing atmospheres for close-control research or full-scale production.

Model HT/HV Vacuum Furnace for high vacuum (0.1 micron), high temperature (3000° F plus) sintering special refractory metals—titanium, zirconium, tungsten, etc. High-speed heating and cooling cycles. Cold wall design, low voltage elements.

Atmosphere Equipment . . . ammonia dissociators; endothermic, exothermic, nitrogen, forming gas generators; Molecu-Dryers for drying protective atmospheres to —100° F D.P. Designed for controlled, dependable operation.

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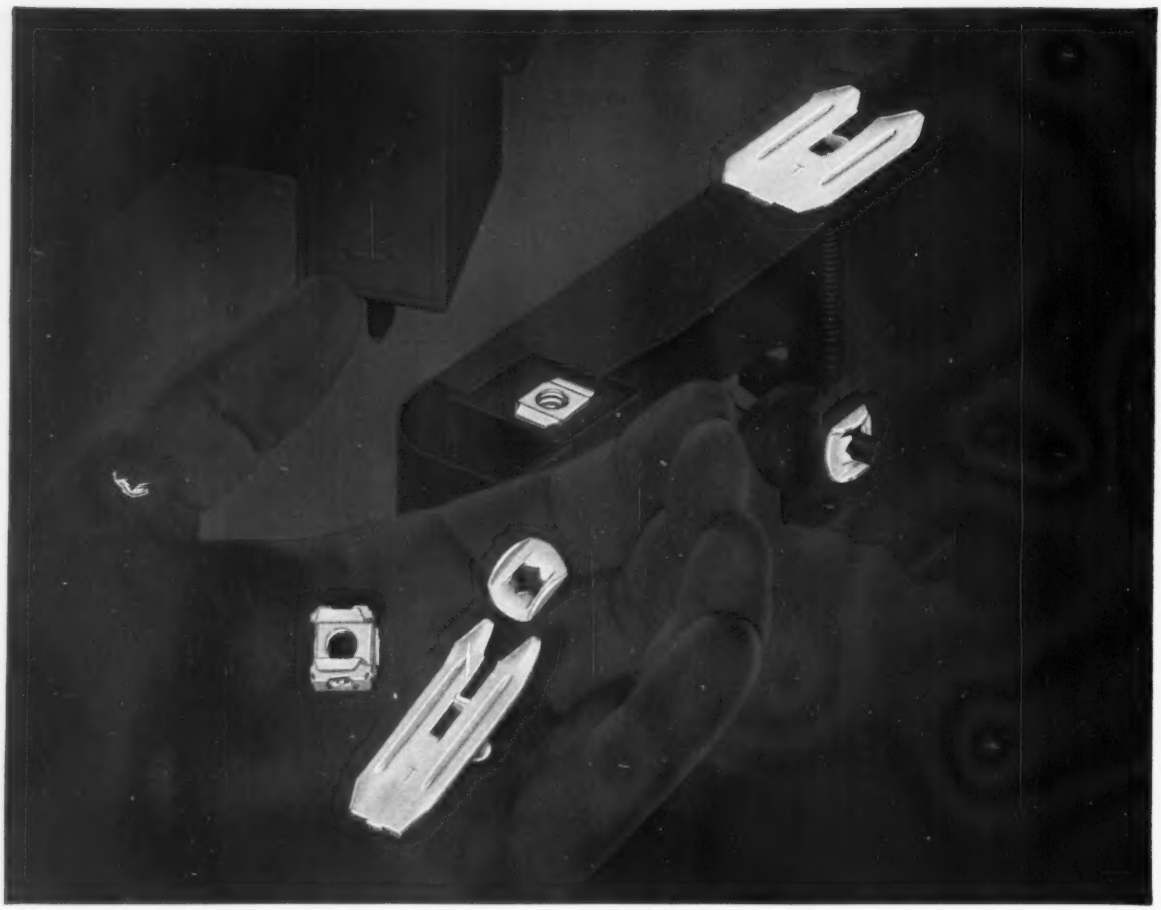

Assembly costs cut 50% at design stage by Tinnerman **SPEED NUT**® Brand Fasteners!

Fastener ideas worked out between designers at Hillside Metal Products, Inc., and Tinnerman engineers, resulted in the selection of 3 different SPEED NUT types for Hillside's complete line of quality steel office furniture. Hillside estimates "at least a 50% saving in material costs, assembly time and tooling" over ordinary fastening methods. And spring-steel SPEED NUTS hold tight, even through years of hard service.

A special Dart-Type SPEED CLIP® snaps into a punched hole, securely anchors one end of the drawer latching mechanism spring. A standard Push-On SPEED NUT "bites" into a stud; prevents the other spring end plus latching bar from backing off. Desk tops as well as desk and table legs, are attached with the help of SPEED GRIP® Nut Retainers that snap into bolt-receiving position in punched holes. A Push-On completes the file drawer follow block assembly; two more secure each filing cabinet drawer card holder.

This should give you an idea of what a free Fastening Analysis can probably do for you in savings and improvements on present or new products. Look up your Tinnerman representative in the Yellow Pages under "Fasteners". Or write to

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JACOB J. JAEGER
P&W president

ROBERT B. SHULTERS
Thor Power eng.-dir.

ROBERT SHELDON
Kahn & Co. vice president

HERMAN H. PANCAKE
Irwin-Sensenich executive

Jacob J. Jaeger was elected president, **Pratt & Whitney Co. Inc.**, West Hartford, Conn. Former executive vice president, he succeeds **Edward P. Gillane**, who was elevated to the position of assistant to the chairman. In this capacity, he works closely with Alfons Landa, chairman of P&W and chairman of the executive committee of Fairbanks Whitney Corp., parent company.

Adolph Vlcek Jr. was appointed director of manufacturing at **Martin Co.'s** Baltimore Div. He succeeds **Vernon R. Rawlings**, general manager of Martin's new Activation Div. Mr. Vlcek was formerly manufacturing engineering and research manager.

Towne Robinson Nut Co., Detroit, elected as vice president: **John R. Hibler**, sales; **John T. Jordan**, purchasing; **Paul DeLoe**, Cold Heading Div.; **Henry P. Selman**, Steel Mill & Tapping Div.

Thomas Haskins was named senior buyer, General Purchasing Dept., **Rockwell Mfg. Co.**, Pittsburgh. He was supervisor of the Accounts Payable Dept.

United States Chemical Milling Corp., Manhattan Beach, Calif., promoted **L. B. Stearns** to the new post of project manager; **Don C. Atkins**, director of the new Technical Dept.; **J. T. Willoughby**, chief engineer.

Harold B. Nicholas was promoted to sales manager, Instrument Div., **Humphrey Inc.**, San Diego, Calif.

Robert B. Shulters was made director of engineering at the Aurora, Ill., Works, **Thor Power Tool Co.** He directs engineering, and research and laboratory operations at Aurora.

Robert Sheldon was named vice president-engineering; **Robert Hamerschlag**, vice president-sales, **Kahn & Co. Inc.**, Hartford, Conn.

Paul Kuehn, purchasing agent for **Ceco Steel Products Corp.**, Chicago, fills the new post of manager of purchases. **L. A. Metz**, vice president, formerly in charge of purchasing, will be on special assignments.

W. R. Bruce was made manager of material, **Convair Div.**, San Diego, Calif., General Dynamics Corp. He was chief of subcontracting at Convair-San Diego.

Russell E. Skinner was made manufacturing manager for **Ford Motor Co.'s** Indianapolis Steering Gear & Cold Heading Plant. He was manager-Manufacturing and Plant Engineering Dept. at the company's Canton, Ohio, forge plant.

Wesley A. Songer was elected executive vice president, **Crane Co.**, Chicago. He was executive vice president, American Safety Razor Corp.

Woodman Perine, president, Vitro Engineering Co., was named vice president of **Vitro Corp. of America**, New York. He is succeeded at Vitro Engineering by **James C. Tourek**, chief project manager, who will be acting general manager.

Herman H. Pancake was named administrative vice president, **Irwin-Sensenich Corp.** (formerly Irwin-Foundry & Mine Car Co.), Irwin, Pa. He was manager of mining and industrial sales with American Car & Foundry Div., ACF Inc.

Robert E. McKee was made sales manager, **R. K. LeBlond Machine Tool Co.**, Cincinnati.

David G. Kelton, assistant general sales manager, **Cleveland Cap Screw Co.**, Cleveland, was made sales manager, eastern states territory.

Charles Seaberg was made superintendent; **Stanley P. Darbut**, assistant superintendent, Blast Furnace Dept., Midland, Pa., Works, **Crucible Steel Co. of America.**

John S. Davey was elected vice president-sales, **Russell, Burdsall & Ward Bolt & Nut Co.**, Port Chester, N. Y. He was vice president-research and engineering.

James M. Killpack was elected chairman, **Ferry Cap & Set Screw Co.**, Cleveland. He becomes Ferry's chief executive officer, succeeding **C. B. Lansing Jr.**, who resigned recently as president.

At Kaiser Steel Corp.'s Fontana, Calif., plant, **Mitchell A. Thompson** was made superintendent, Open Hearth Dept.; **Charles W. Ashcom**, chief metallurgical engineer; Engineering & Planning Div.; **Lawrence Young**, assistant general superintendent, Services Div.

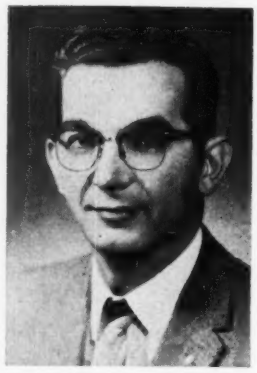
Cy Jenkins was made sales man-

ROBERT S. HANDLY

EDWARD F. HEFFERNAN JR.

Continental-Diamond Fibre promotions

MAXWELL M. WACHOWIAK



JAMES A. MILLER

Minneapolis-Moline mfg. and eng. directors

ager, **Essex Conveyors Inc.**, Nutley, N. J.

Robert S. Handly was made manufacturing manager in a tristate area for **Continental - Diamond Fibre Corp.**, subsidiary of Budd Co. With offices in Newark, Del., he is responsible for operations of CDF plants in Bridgeport, Pa., and Valparaiso, Ind., and Newark. **Edward F. Heffernan Jr.** was made plant manager, Bridgeport.

Lawrence C. Walkley was named vice president-operations, **Westinghouse Air Brake Co.**, Pittsburgh. He was vice president and treasurer. **Edward D. Greiner** was elected vice president-finance. **Joseph S. Smith** was elected treasurer.

Robert W. Kerr was elected president, **Fairbanks, Morse & Co.**, Chicago, to succeed **Robert H. Morse Jr.**, who was named vice chairman. **Frank H. Cankar**, who recently joined the firm, was elected to the new post of vice president-administration. Mr. Kerr is also vice president in charge of subsidiary operations for Fairbanks Whitney, an office he assumed Mar. 1. Prior to that he was vice president and group executive of American Machine & Foundry Co. Mr. Cankar had also served with AMF as vice president-general manager, Cycle Div.

C. Leonard Johnson was made sales manager, **Synthane Corp.**, Oaks, Pa.

Nichols Wire & Aluminum Co., Davenport, Iowa, promoted **Girard J. Brenneman** to marketing manager; **James D. Case**, manager of sales, Mill Div.; **C. L. Johnston**, general manager, Warehouse Div.

Frank E. Walling was made general superintendent; **Ernest Soffronoff**, superintendent of maintenance at **Colorado Fuel & Iron Corp.'s** Claymont, Del., plant. Mr. Walling, who joined CF&I in 1957, was product engineer at the Claymont plant. Mr. Soffronoff was an electrical engineer in Claymont's Engineering Dept.

Maxwell M. Wachowiak, executive vice president, Wall Tube & Metal Products Co., Newport, Tenn., was appointed director of manufacturing of **Minneapolis-Moline Co.**, Hopkins, Minn. **James A. Miller** was made director of engineering. He was chief engineer of lift trucks for Clark Equipment Co., Battle Creek, Mich.

William C. Krecklow and **George J. Slies** were promoted to general superintendents in the Manufacturing Dept. of the Industries Group, **Allis-Chalmers Mfg. Co.**, Milwaukee. Mr. Krecklow is at the West Allis Works. Mr. Slies is in the Hawley Shop.

John D. Kirkwood was named general sales manager, **Truscon Div.**, Youngstown, Republic Steel Corp. He succeeds **C. B. McGehee**, assigned other duties at Republic. Mr. Kirkwood was manager, Steel Joist & Tower Products Dept. there.

John G. Ziemann was made assistant chief metallurgist, Metals Div.,

ROBERT W. KERR

FRANK H. CANKAR

Fairbanks-Morse president, v.p.-administration

FRANK E. WALLING

ERNEST SOFFRONOFF

CF&I supervising appointments

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E. S. TWINING JR.
Air Reduction Sales v. p.

H. B. CARR
Kinney v. p.-engineering

JOSEPH C. OLSON
Bullard mfg. v. p.

MAX GARBER
Consolidated Electro. marketing

Kelsey-Hayes Co., New Hartford, N. Y. He was research metallurgist.

H. B. Carr was appointed vice president-engineering; **J. D. Morrow**, vice president and treasurer, **S. P. Kinney Engineers Inc.**, Carnegie, Pa.

Joseph C. Olson was elected vice president - manufacturing, **Bullard Co.**, Bridgeport, Conn. He was factory manager.

Arthur P. G. McGinnes Jr. was made manager, **American Non-Gran Bronze Div.**, Chicago, Hupp Aviation Co.

Herbert DeBorde, plant manager, Military Electronic Computers Div., Detroit, Burroughs Corp., was promoted to manager of **Control Instrument Co.**, Brooklyn, N. Y., a subsidiary.

Walter Stern joined **Iroquois Steel & Iron Co.**, Chicago, as vice president, Scrap Iron & Steel Div.

Max Garber was made director of a newly established separate marketing operation for the Rochester, N. Y., Div. of **Consolidated Electrodynamics Corp.** He was manager of the company's eastern regional office in Philadelphia.

Albert H. Damon was elected president and general manager, **Edgcomb Steel of New England Inc.**, Nashua, N. H., and **Earl H. Cotton** as treasurer. They fill offices held by the late **Arthur W. Moody.** Mr. Damon was vice president-general manager. Mr. Cotton was controller.

John P. Davidson was made production control manager of **Chrysler Corp.'s** new Process Gear Div., Syracuse, N. Y. He was in Detroit's Axle & Transmission Div. office.

John K. Elder was made vice president, Applied Research & Testing Laboratories, **Rocket Power Inc.**, Mesa, Ariz., a newly formed subsidiary of Gabriel Co.

Victor H. Lanahan was appointed purchasing agent for the Pittsburgh plant of **Heppenstall Co.** He was manager of ring sales.

Baxter Fullerton was made director of **Warner & Swasey Co.'s** new Marketing Services Dept., which co-ordinates and provides single control over all areas of marketing not directly connected with field selling. Former assistant to the vice president-sales, he has been with W&S, Cleveland, since 1942.

E. S. Twining Jr. was appointed vice president-marketing, **Air Reduction Sales Co.**, New York, division of Air Reduction Co. Inc. He was manager, Gas Dept.-marketing, and is succeeded by **G. L. Werly Jr.**

M. R. Wilkens was named to the new post of sales planning manager, Industrial Products Div., **Hewitt-Robins Inc.**, Stamford, Conn.

At **Inland Steel Co.'s** Indiana Harbor Works, East Chicago, Ind., **Joseph S. Mohr Jr.** was made assistant superintendent-coke production; **Donald M. Houpt,** assistant purchasing agent; **Robert H. Ficken,** staff assistant of purchasing research.

Norman F. Weyland was made general sales manager, **Wales-Strippit Inc.**, Akron, N. Y., unit of Houdaille Industries Inc. He is succeeded as midwest division manager by **John Rinaldo.**

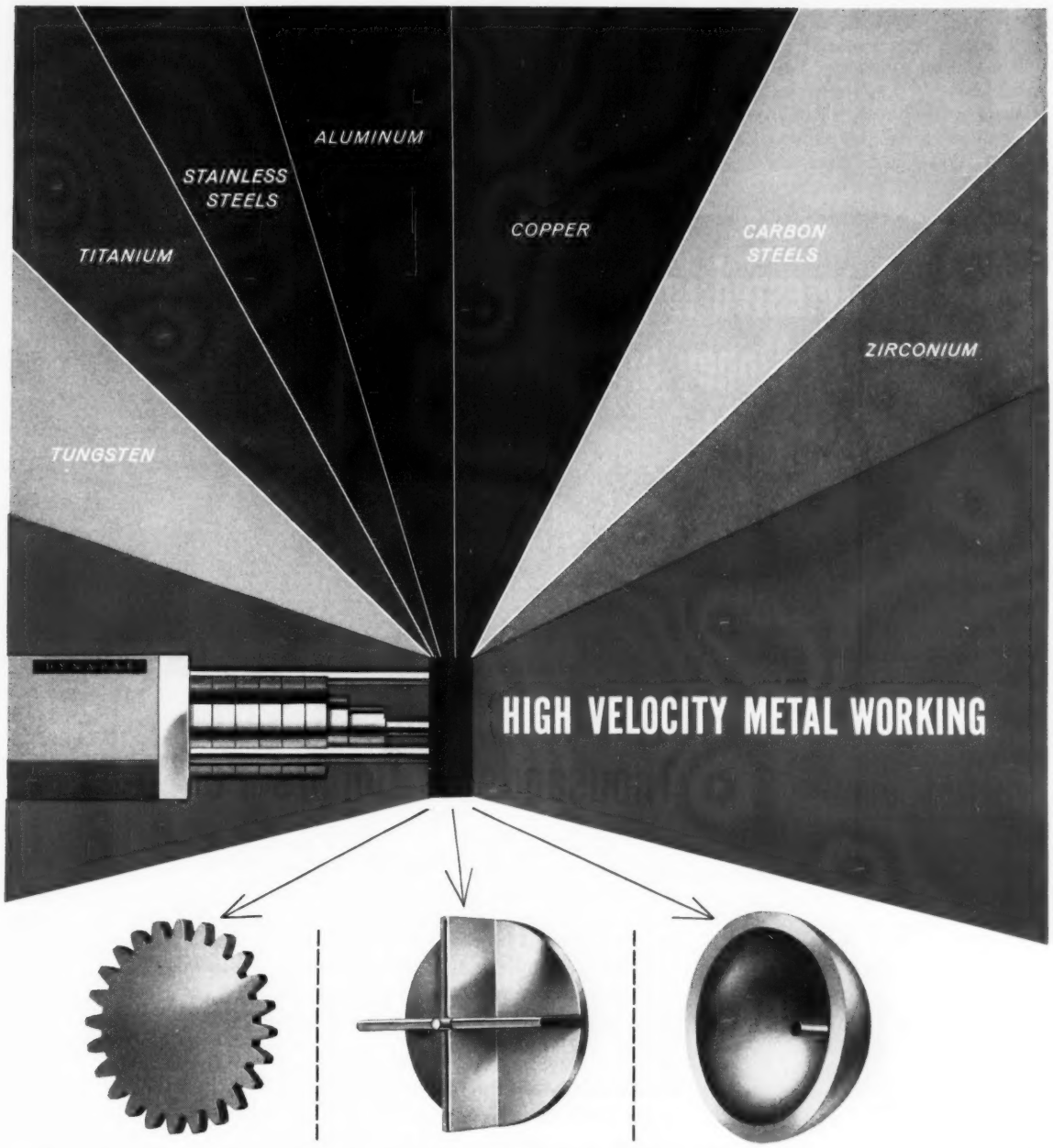
John P. Bacon joined **Elion Ultrasonics Inc.**, subsidiary of Elion Instruments Inc., Bristol, Pa., as chief applications engineer. He was project engineer in ultrasonics with Curtiss-Wright Corp.

Lamson & Sessions Co., Cleveland, announces retirement of **Carl F. Henkel** as comptroller, and appointment of **P. J. Rudden** as assistant treasurer.

OBITUARIES...

Jack F. Croasdale, 54, vice president, **Revere Copper & Brass Inc.**, and executive head of its Baltimore Div., died June 19.

William R. Milburn, 67, supervisor of marine and naval engineering, **Cutler-Hammer Inc.**, Milwaukee, died June 18.



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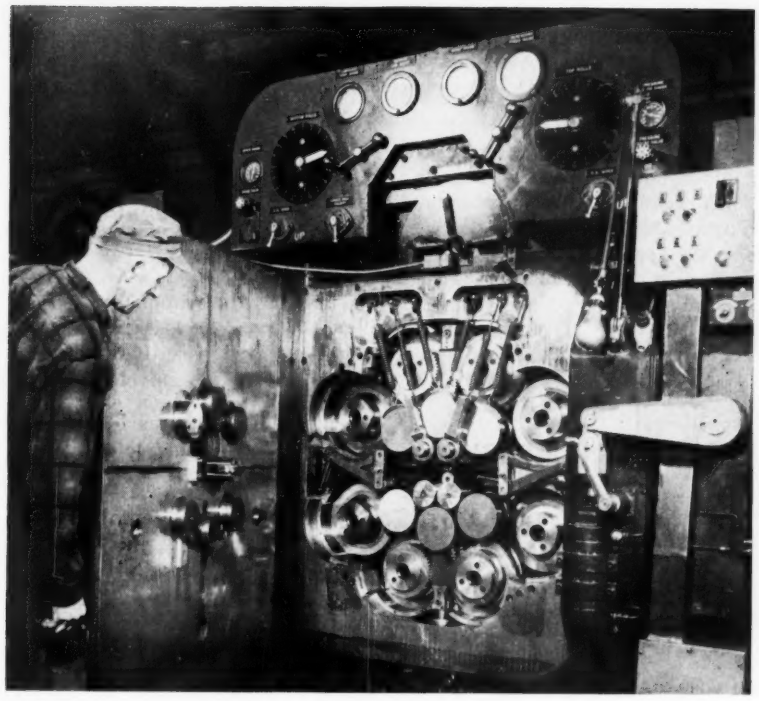


Approaching the complexity of a pocket watch, this Sendzimir mill at U. S. Steel's Vandergrift plant rolls stainless steel strip to finished gages as thin as 0.015 in. Bill Myers closes the mill's door as the unit is ready to roll

U. S. Steel Lifts Capacity At Its Vandergrift Plant

FACILITIES at the Vandergrift, Pa., plant of the Irvin Works, U. S. Steel Corp., have been enlarged and improved for the production of continuous, cold rolled, stainless steel. Modernized facilities for production of grain oriented, silicon steel sheets and coils also are in full operation at the plant.

• **Stainless Steel**—Capacity for making continuously produced, cold rolled, stainless steel sheets has been increased 50 per cent to 40,000 tons. Heretofore, U. S. Steel's production of such sheets was centered at its Gary, Ind., plant. It now has facilities at Vandergrift for making continuous, stainless steel sheets (cold reduced and hand milled) in a full range of sizes with widths up to 72 in.

Included in the Vandergrift setup is a new Sendzimir mill, designed for cold rolling wide, light gage, stainless steel coils from hot bands produced at the Irvin Works, Dravosburg, Pa. The unit can reduce 48 in. wide coils at the rate of 700 fpm. The intermediate steps of annealing and pickling, which are necessary when cold rolling on a conventional mill, are largely eliminated.

Companion facilities for stainless steel sheet production now in operation include a 664 ft continuous annealing and pickling line, and shearing, leveling, inspecting, and conditioning lines.

• **Silicon Steel**—Capacity for producing electrical sheets and coils has been hiked to 130,500 tons a year. New equipment includes continuous annealing lines; high temperature, batch type, electrical annealing furnaces; and batch type, gas fired, annealing furnaces. The new facilities put U. S. Steel in an advantageous position to compete in the rapidly expanding market for grain-oriented steel, says M. M. Chapman, administrative vice president-commercial.

Bethlehem Makes Shift

Bethlehem Pacific Coast Steel Corp. has been made part of Bethlehem Steel Co. of Pennsylvania. The steel division is now the Pacific Coast Div., Bethlehem Steel Co. The Shipbuilding & Ship Repair Div. is now known as the Shipbuilding Div., Pacific Coast District, Bethlehem Steel Co.

Learner Co. Buys Plant

Learner Co., Oakland, Calif., scrap metal and ship salvage firm, acquired California Metals Co.'s iron and steel processing plant at Pittsburg, Calif.

NEW ADDRESSES

Metallurgical Products Dept., General Electric Co., Detroit, moved its Cleveland sales office to 130 Northfield Rd., Bedford, Ohio. The department makes Carboloy cemented carbides.

Aluminum Co. of America, Pittsburgh, moved its Pontiac, Mich., branch sales office to Mott Foundation Bldg., Saginaw and First Street, Flint, Mich. Branch manager is F. C. Pyne.

J. R. Winter Pressed Steel Co., Detroit, moved its factory to Napoleon, Ohio. The firm makes rocker arms for International Harvester engines.

Phillips Mfg. Co., maker of engine heaters, moved into its $100,000 plant at 8200 S. Grand Ave., Minneapolis.

Arcos Corp., Philadelphia, moved its New England district office to 45 Kearney Rd., Needham Heights, Mass. The company makes welding electrodes and rods.

Van Huffel Tube Corp., Warren.

Ohio, established a sales office at 4757 E. Slauson Ave., Maywood, Calif. Ken Abbott is manager of the office, Van Huffel Western Corp. The firm makes metal tubing and rolled steel sections.

NEW PLANTS

Refractories Div., H. K. Porter Company Inc., Pittsburgh, has begun full production of its basic refractory specialty, Plastikrom, at a $12 million plant at Pascagoula, Miss. Principal applications of the plastic chrome ore include linings in open hearth furnace subbottoms and doors, small ladles, bottoms of various heating and forging furnaces, and patching in copper and brass furnaces.

North American Refractories Co., Cleveland, has expanded its Cleveland warehouse facilities 80 per cent by leasing space at 47th Place and Holyoke Avenue.

Carpenter Steel Co., Reading, Pa., opened a steel service center in Ft. Washington Industrial Park and Office Center in suburban Philadelphia. Robert A. Kokat, Philadelphia district manager, will direct operations.

American Pulley Co. will build a plant adjacent to its present facilities at 4200 Wissahickon Ave., Philadelphia. A new product line will be announced to the trade soon. The company makes power transmission and material handling equipment. Van Norman Industries Inc., New York, recently acquired control of American Pulley.

Permaglas Div., A. O. Smith Corp., Kankakee, Ill., has initiated production in its 250,000 sq ft plant in Newark, Calif. Capacity is 10,000 water heaters a month on a one shift basis and could be increased to 25,000 when warranted. Shift of water softener output from Refinite Corp.'s Omaha, Nebr., plant to Kankakee has been completed. Don Hartquist is manager of the Newark plant.

Rocket Power Inc., Mesa, Ariz., is building a plant to produce solid fuel for rockets and missiles. The company is a wholly owned subsidiary of Gabriel Co., Cleveland. Gabriel's $1 million electronic facilities at Millis, Mass., are being constructed on schedule.

Philco Corp., Philadelphia, is building a multimillion dollar computer center in Upper Moreland Township, Montgomery County, Pa. Occupancy of the 200,000 sq ft facility is scheduled for early November.

CONSOLIDATIONS

Intervale Steel Corp. and **Barry Universal Corp.,** Detroit, have merged. Intervale, a steel processing firm, will be operated as a division of Barry Universal, producer of cold rolled strip steel.

Vermont Tap & Die Co., Lyndonville, Vt., purchased **Hommel Corp.,** Grove City, Pa., manufacturer of powered screw driver bits. Machinery and equipment for manufacturing this line will be moved to Vermont.

Skil Corp., Chicago, producer of power hand tools, purchased **Nordon Die Casting Co. Inc.,** Maywood, Ill., and will operate this producer of aluminum and zinc castings as a subsidiary.

Zero Mfg. Co. purchased **Electronic Welding Co.** Both are in Burbank, Calif. Zero is a metal fabricating firm while Electronic offers diversified commercial welding services.

Plate & Structural Steel Ltd., Toronto, Ont., acquired **Dixie Steel Works Ltd.,** that city, and will operate the property under the name of Plate & Structural Steel Tanks Ltd.

Drake Steel Supply Co. purchased **Zurbach Steel Co. of California.** Drake's sales and administrative personnel will be concentrated at the main plant at 6105 E. Bandini Blvd., Los Angeles, Calif. It operates branches in Fresno and San Diego, Calif. The firm plans to install additional machinery, such as steel slitters and sheet coiler levelers. Zurbach Steel will be operated as a division and will continue to distribute principally sheet and strip steel products from its plant at 2035 Camfield Ave., Los Angeles.

ASSOCIATIONS

American Electroplaters' Society Inc., Newark, N. J., elected R. D. Wysong, Studebaker-Packard Corp., South Bend, Ind., president.

American Society for Testing Materials, Philadelphia, elected these officers: President, F. L. LaQue, International Nickel Co., New York; and vice president, Miles N. Clair, Thompson & Lichtner Co., Brookline, Mass.

Machinery Dealers National Association, Washington, elected these officers: President, Victor Segal, Victor Machinery Co., Chicago; first vice president, Bud Corrigan, Noll Equipment Co., Cleveland; second vice president, Alex Zeeve, Alex Zeeve & Co., New York; treasurer, Richard Strom, Strom Machinery Corp., Hammond, Ind.

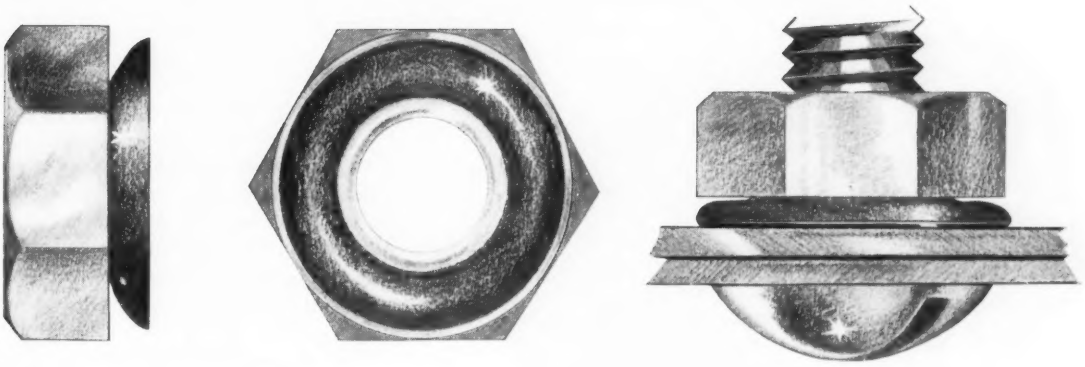
New officers of **National Association of Metal Finishers,** Chicago, are: President, A. T. Leonard, Superior Plating Inc., Minneapolis; first vice president, R. L. Giesel, Adolph Plating Co. Inc., Chicago; second vice president, E. N. Marlette, Marlette Plating Co., Chicago; secretary-treasurer, Frank Kaiser, Long Island Mechanical Plating Co. Inc., Woodside, N. Y.; and assistant secretary-treasurer, Sal Novelli, Service Plating Co., Brooklyn, N. Y.

Investment Casters Society, Los Angeles, elected these officers: President, Allen Smith, Picco Inc., El Monte, Calif.; vice president, Myron Orbach, Bone Engineering Corp., Glendale, Calif.; and secretary-treasurer, Dick Ells, Dick Ells Co., Los Angeles.

James H. Templin was appointed executive vice president of the **Automotive Engine Rebuilders Association,** Indianapolis.

Arnold F. Meyer, Heil Co., Milwaukee, was elected president of the **National Truck Tank & Trailer Tank Institute,** Chicago.

NEW TENZ-NUT®



preassembled for fast production . . .

Now — a spring washer preassembled on a hex nut — to save time in all types of assembly operations where the tested principle of bolt, nut and spring washer are required. Developed by Eaton-Reliance, this new fastener is now available for production use.

The spring washer — a modified Belleville, or "cupped" type — is firmly attached to the hex nut, yet it spins freely during application and removal. Tenz-Nuts are reusable.

The proven locking principle of the cupped-type washer, when combined with a hex nut, gives you a versatile fastener for automatic assembly operations. It is particularly applicable where finished parts are being assembled and it is desirable to minimize surface marring. Tenz-Nuts may also be adapted as sealing nuts.

Write for our new Engineering Bulletin which fully describes Tenz-Nuts.

Eaton also offers a complete line of Keps®— hex nuts preassembled with tooth-type washers. Our fastener engineers will gladly consult with you on possible applications on request.

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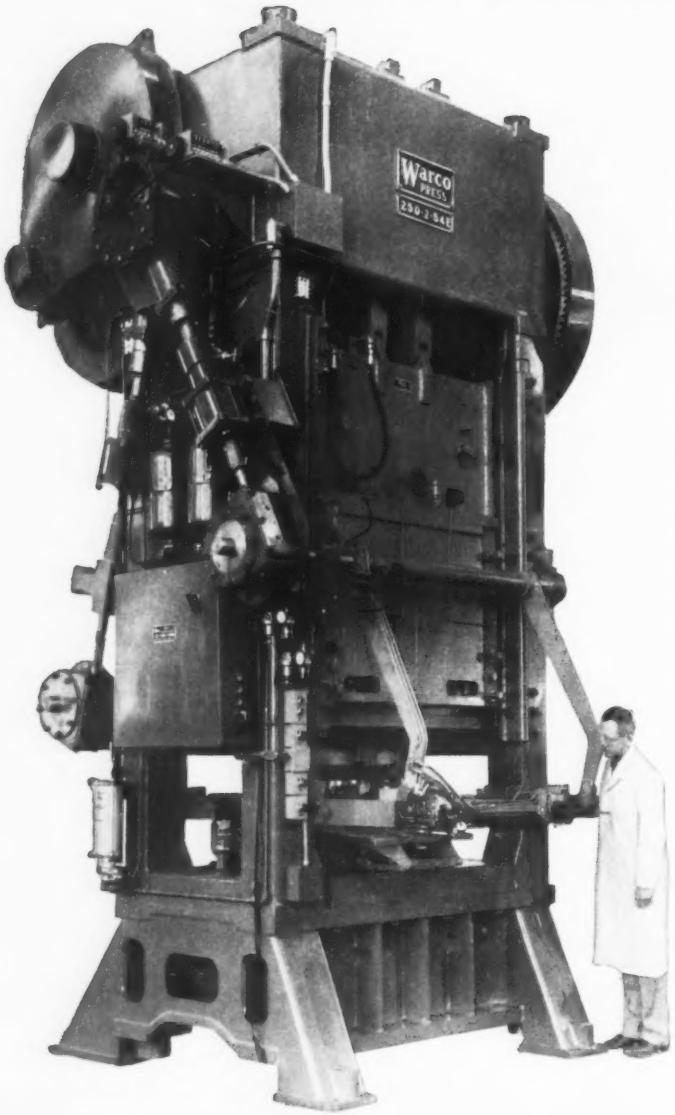
Warco automation



You can expect mechanical presses of unsurpassed quality when you specify Warco, for every Warco press is designed and custom built with machine tool precision. The result: Warcos work better, faster—with substantially reduced maintenance.

This typical Warco 250 Ton Double Eccentric Shaft Straight Side Press is being used by a leading farm equipment manufacturer to automatically feed and *hot form* the camber and accurately punch and countersink bolt holes in heavy gauge plow shares, discharging them automatically into a heat treating bath. Press slide incorporates a hydro-pneumatic overload device.

If you're considering press equipment, remember . . . if you want maintenance-free quality—you want Warco.

Federal® WELDERS

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THE FEDERAL MACHINE AND WELDER COMPANY • WARREN, OHIO

Technical Outlook

July 6, 1959

POWDER METALLURGY WITH A BANG— Steel bars are made from powder in a process under development by Republic Steel Corp., Cleveland, and E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. Metal powder, encased in an explosive film, is compressed by a predictable force. Suggested application: Consumable electrodes for vacuum arc melting furnaces.

BETTER ENAMELING GRADE—Two years of research have turned up what is said to be a superior grade of porcelain enameling sheets. The developer, Bethlehem Steel Co., Bethlehem, Pa., says it cuts boiling and fishscaling to the minimum. (See story about a new one coat enameling process on Page 76.)

SAVES NITRIDING TIME— Liquid pressure nitriding cuts 8 to 16 hours from conventional processing time, says A. F. Holden Co., Detroit, which developed the new technique. Steel parts are immersed in molten salt while anhydrous ammonia is passed through the bath at 15 psi. (Flow rate runs from 20 to 40 cu ft an hour.) Other advantages: Less distortion, and elimination of white deposits from spent ammonia gases.

BIGGER STELLITE SHEETS—You can get the metal in 0.010 in. sheets 36 in. wide and 96 in. long, says Haynes Stellite Co., a division of Union Carbide Corp., New York. Recent refinements in technique brought about the change.

ALUMINUM SOLDERING WRINKLE—A new process involving zinc will probably simplify aluminum joining problems, Aluminum Co. of America thinks. With the right technique, it works especially well on thin sections, says the company.

LIQUID HYDROGEN IS FEASIBLE— Once thought unworkable, liquid hydrogen is just as easy to handle as liquid oxygen, says Lt. Gen. Bernard A. Schriever, commander, Air Research & Development Command, Wright-Patterson Air Force Base, Ohio. Feasibility tests were made by Aerojet-General Corp., a subsidiary of General Tire & Rubber Co., Azusa, Calif.

GLASS WELDING NOZZLE— Inert gas welding torches equipped with transparent glass nozzles help the operator see what he's doing, says Corning Glass Works, Corning, N. Y. An inside ground joint eliminates a gasket.

IMPROVING REACTOR STEELS— Atomic reactors will be made with better steel if a joint research program pans out, say General Electric Co. and U. S. Steel Corp. Testing will be done over the next two years at GE's Valecitos Atomic Laboratory, Pleasanton, Calif.

PREDICTS STRONGER STEELS—"There's no reason why we won't have steels stronger than 300,000 psi," says W. R. Patterson, general superintendent, National Supply Co., Torrance, Calif. "Sound metallurgical theory indicates the figure can go much higher."

FOAM USE SPREADS—Urethanes are opening a whole series of ways to improve mechanical devices and buildings, says Dayton Rubber Co., Dayton, Ohio. Examples: Two metal sleeves with foam cast between them make an excellent resilient torqueshaft for autos, and the material can be used to fill rubber tires.

HIGH TEMPERATURE DEVELOPMENT— Boeing Airplane Co., Seattle, is working on new materials which will stand up to 4000° F in certain engine areas. The work is Air Force sponsored.

TITANIUM IN ANODIZING— Racks for anodizing aluminum auto trim last longer when made of titanium, says Carlson-Erie Co., Erie, Pa., which supplies automakers with a wide variety of trim parts.

PORCELAIN ENAMELERS now have a new way to make their wares.

Called Direct-On, it covers steel with a single coat, instead of two or three needed with conventional methods.

The developer, Ferro Corp., Cleveland, lists these benefits:

1. One firing reduces or eliminates warping.

2. Nonpremium, cold-rolled steels work as well as premium enameling steels. (Saving: $10 a ton.)

3. Coatings are more flexible and tougher.

4. When two coats are needed, finishes are superior to conventional, two coat jobs. (They have more egg shell appearance, less orange peel.)

5. All colors except red can be used.

• The process marks the next step in a campaign to recapture lost markets, move into new ones.

The one coat system is aimed at expanding the use of porcelain on appliances. (Exteriors of most refrigerators, for example, are painted.) Test runs by several firms have turned up substantial cost savings.

At least one company reports saving 4 cents a square foot when a single coat replaced two. (That's based on full production replacing a ground coat and white on one side only.)

Hanson Porcelain Enamel Inc., Hanson, Mass., has used white Direct-On for more than six months on nonpremium steels. The job shop has covered more than 2½ million sq ft satisfactorily.

Ferro says some customers have been testing the method for more

Harry T. Marks, president, Ferro Corp.

. . . discusses his firm's perfection of long sought system which cuts costs, aids fight with competing surface treatments

"Our Real Goal is . . .

much more than a better porcelain—we're after a way to compete with the least costly surface finishes. First, we'll use . . .

"Frits that fire at 1250 or 1300°F . . .

and follow that with lighter gage steels to increase the savings. Our approach interests investors. In Boston recently . . .

"Financial analysts felt confident . . .

when we told them what we're after. For the first time in our history, Ferro's stock is selling for $40 a share."

than a year. Savings, it points out, vary with the product. The key factors: Amount of handling, thickness of coatings, number of sides coated, and cost of steel used.

• Plants will need new pickling equipment.

The process eliminates the traditional opaque, blue ground coat by replacing it with a thin coating of chemically deposited nickel. Sheets start with a degreasing and annealing at 1200° F. A phosphoric acid pickle removes the oxide and prepares the surface for 0.08 gram of electroless nickel per square foot. Complete rinsing and drying ready the sheet for frit. Conventional drying and firing at 1450° F wraps it up.

• Some applications require several coats.

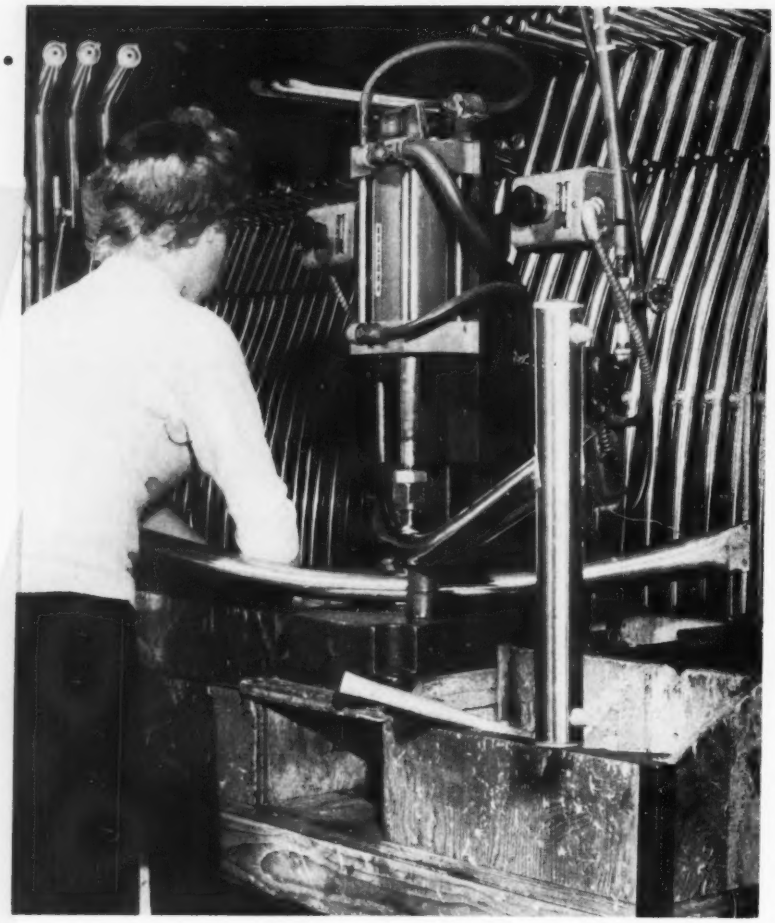
"Although we expect new applications as well as traditional porcelain enameling sales, there are still many situations where two coats are needed," says E. E. Bryant, technical director. "We have found we can produce a superior finish with two cover coats instead of a ground coat and cover coat combination." Ground coats will still be used conventionally for laundry equipment, range ovens, and hot water heaters.

Eliminating production bugs took some patience. Early problems included steel composition, cleanability, acid contaminants, pickle smudge, and fish scaling.

Ferro believes it has found the answers to many such problems.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, *Penton Bldg., Cleveland 13, Ohio.*

Spring Pin . . .



. . . . Trims Assembly Costs

Used as a pivot in the legs of a folding ironing table, it costs less than a solid pin, compensates for variations in hole size, and improves stability of the product

SMALL assembly items, such as fasteners, can sometimes bring large benefits to users in improved product design and reduced production costs.

The substitution of a tubular spring pin for a solid pin is saving $8600 a year at Proctor Electric Co., Baltimore. The firm uses the spring pins to fasten the tubular steel legs of the ironing tables that it manufactures.

• The Sel-Lok spring pins (made by Standard Pressed Steel Co., Jenkintown, Pa.) cost Proctor $6600 less a year than their solid counterparts.

Their spring action also compensates for minor eccentricity of the hole, eliminating the need for a separate hand reaming job for which initial tooling alone cost $2000.

The pins improve the stability of the table. With their self-locking action, they hold the legs firmly in position, despite hole variations. If a cap nut works off, there's little danger that the pin could fall out and make the table collapse.

Compensation for hole wear is automatic. The fastener expands

as the hole wears, maintaining rigidity of the joint.

• Proctor faced a difficult problem in manufacturing and assembling the boards.

The tubular legs are fabricated from strip with a tube forming machine, then cut off, polished, and reinforced with armored support plates at the pivot point.

The tubes are pierced to provide holes for the pivot pin and are then contour formed. The curvel leg puts maximum support where it's most needed, while affording the housewife more legroom than conventional boards provide.

• Piercing the tubing introduces the special problem.

Economically, it's the only practical way to make the holes in a heavy volume operation. But the hole pierced on the far side of each tube is not as clean and round as the one on the near side. The slug punched out from the first hole rides on the tool face and punches out the second hole.

Contour forming of the legs accentuates the difficulties. Because the legs are curved, one hole elongates while the second foreshortens during forming.

Result: When solid pins were used as pivots, there was a slight degree of play in the fit. Proctor considered drilling, instead of piercing the holes, to improve stability of the tables. The company finally settled on a separate reaming operation as the better way of rounding holes.

A Standard Pressed Steel Co. representative persuaded Proctor to try the spring pins. They did the job.

• Proctor devised an air operated pin driver and a fixture for driving the pins in the leg assembly operation.

If legs were positioned by the operator with holes slightly out of line, a driven pin would tend to collapse the walls of the tubular legs.

At the SPS representative's suggestion, the fixture was fitted with two rubber bumpers on either side of the locating pin to support the top legs. They solved the problem.

Boat trailer fenders are made from a shaped blank with one hit in the die. No trimming is needed. Die lubricant, which gives wrinkled appearance, can be wiped off

Drawing Method Eliminates Final Trimming Operation

A FABRICATION process that makes it possible to produce special fenders in one drawing operation, without trimming, is being used by Saginaw Sheet Metal Parts Corp., Saginaw, Mich.

As a result of the economies in its production method, the company says it now makes about 75 per cent of all fenders used on boat trailers.

A typical customer, Peterson Bros. Inc., Jacksonville, Fla., buys fenders for Gator boat trailers. They are formed in 16 gage, drawing quality, cold rolled sheets supplied by Jones & Laughlin Steel Corp., Pittsburgh. They have a draw depth of 4½ in., are 26 in. long, and 7¾ in. wide. A 12 in. radius across the crown runs into a 1½ in. radius on each side.

• Fabrication has five steps.

Rectangular blanks are sheared from sheets to a size that can be shaped by a blanking die. After shaping, the blanks are formed along the sides to a specified radius. That makes them fit into the special dies that are most important in lowering the cost of the production process. The final operation is punching the mounting holes, which, except for enameling, readies the fenders for mounting on the trailer.

The biggest fenders (for farm tractors) have a 37 in. radius. They are crown rolled from flat blanks 22½ x 96 in. and are made to a rounded contour 17½ in. wide.

Improved Bend Tester Aids Ductility Study

Simple machine enables titanium firm to check best forming temperature by free bending small coupons. Device is also useful on other metals at room temperatures

FASTER, MORE ACCURATE bend tests of sheet metals are the benefits of an invention at Titanium Metals Corp. of America, New York, to help determine the best temperature and the amount of formability of titanium sheets.

Although of primary concern to manufacturers who handle titanium, the machine will help you form other metals at room temperatures.

It eliminates the dies normally needed for conventional testing machines and uses much less stock, says TMCA.

• A microscope helps the operator check formation of hairline cracks.

The machine provides accurate test information about forming temperatures. It eliminates complicated heating procedures and transfer of samples from bench to furnace.

A 10 or 20 power microscope permits continuous observation of the surface being bent—it requires little adjusting during the test because of a folding mount which approximately duplicates the movement of the test sample.

Operator examines specimen at end of test. Hairline cracks which form at critical point determine stopping point of squeeze. Microscope reveals crack the instant it forms

For room temperatures, the bottom anvil is lowered and a 1 by 2 in. specimen slipped into place. As pressure is applied, a V-shaped pusher starts the specimen bending in the right direction. The lower anvil then raises to continue the bending until a hairline crack can be detected. The radius of the sample at that point depends entirely on sample ductility, the company says.

• A split furnace surrounds the sample and anvil.

The heat is provided by electric tubes. The furnace has an observation port for the microscope. Temperatures are held at 1200 to 1300° F.

A little compressed air passing through the upper anvil support (it's hollow) cuts the temperature differentials to less than 10° F around the specimen. It also reduces overheating of the upper anvil.

After testing, ductility can be measured two ways:

1. (For temperatures less than 400° F.) You can photoengrave a grid on the sheet surface. Plastic strain near the hairline crack can be measured with a microscope. A common practice is to convert the value of strain to a minimum or critical bend radius in terms of sheet thickness (radius divided by thickness, for example).

2. (For all higher temperatures.) You can measure the inside radius of a specimen with a radius gage and calculate the critical bend radius in terms of sheet thickness as above. (If the inside radius is too small, you can estimate it by sectioning the sample and examining it or a photomacrograph.)

TMCA says that operators can be trained rather quickly to detect the minimum radius within plus or minus 0.2 times the metal thickness.

• Titanium formers expected to benefit most.

Manufacturers who form Ti-6Al-4V and Ti-5Al-2.5Sn at high temperatures, will find this method significant, say Titanium Corp. engineers. The machine is said to be comparatively inexpensive to construct.

Bronze Surfacing Adds Life, Reduces Excessive Repairs

Surfacing pistons with bronze adds life and prevents excessive repairs, says Hydraulic Press Mfg. Co., a division of Koehring Co., Mt. Gilead, Ohio.

The treatment minimizes wear problems by making pistons resistant to friction without damaging the strong steel core necessary to withstand high pressure in hydraulic equipment.

Hydraulic Press converted a semiautomatic welding machine to fully automatic operation. It surfaces pistons 4 to 20 in. in diameter.

With the welding torch fixed in position, 1/16 in. diameter Oxweld No. 62 wire is deposited automatically as the piston rotates under the torch. The torch is positioned manually for each circumferential head by a rack adjustment. Three to five passes are required to deposit a 1/4 to 3/8 in. thick surface. Argon shields the weld zone.

A 1/4 in. surface is deposited on pistons 6 in. in diameter and 8 in. long. Each is machined to about 1/8 in. thick and is then heat treated at 835° F to increase the bronze surface hardness.

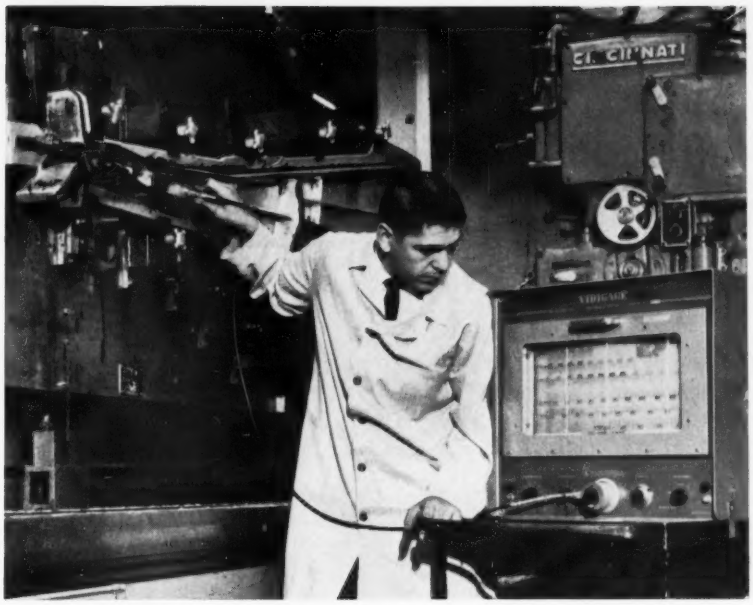
The portable, semiautomatic welding machine (SWM-2 Sigma) is a product of Linde Co., a division of Union Carbide Corp., New York.

Upgrade Bessemer Product

Two bessemer converters at Wheeling Steel Corp.'s Steubenville South Works, Mingo Junction, Ohio, will be revamped to produce low nitrogen steel, says Paul W. Koenemund, vice president of operations. The converters will be bottom blown with a mixture of steam and oxygen instead of air.

Steel produced will be of open hearth grade. It will have a wider range of applications than the standard bessemer product. Currently, the plant's bessemer output is used only for pipe and roofing.

The changeover, slated for completion in about a year, will include construction of an oxygen generating plant at Mingo Junction and an oxygen pipeline from Steubenville South Works to Steubenville North Works.



This ultrasonic gage accurately measures (from one side) a wing component for a new fighter-bomber. The unit makes it unnecessary to remove the part from the milling machine for gaging

Ultrasonic Gaging Faster, Keeps Specified Tolerances

Operation is easy. The ceramic transducer is applied to the work and the thickness appears on a direct reading scale. Accuracy is within 0.1 to 1.0 per cent

NEED quick gaging where you have access to only one side?

The job is being done by an ultrasonic unit (called Vidigage) at Republic Aviation Corp., Farmingdale, N. Y. Finished thicknesses stay well within the specified tolerance (±0.010).

• **Problem** — During machining, only a small portion of a spar cap (a wing component) is exposed. Periodic gaging with standard methods would be costly and time consuming. The part would have to be removed after each pass of the milling cutter, measured, then carefully repositioned.

• **Solution** — Republic Aviation found that an ultrasonic gage could measure thickness accurately while the part is mounted on the milling machine. Access to only one surface is necessary. The operator simply applies the ceramic transducer to the work, and quickly notes the thickness on a direct reading scale.

Little training is needed to use the instrument effectively.

Ultrasonic gaging is based on the principle that the natural frequency of a metal or plastic varies inversely with its thickness. Continuously varying ultrasonic vibrations are transmitted into the material being inspected. Reflected waves are picked up by the instrument and resonant frequencies or harmonics are amplified. The resonant frequencies then show up as vertical traces on a cathode ray tube and are correlated directly to the thickness by a suitably calibrated scale.

Instrument accuracy is within 0.1 to 1.0 per cent, depending upon thickness and type of material. The unit is made by Branson Instruments Inc., Stamford, Conn.

Tungsten Billets, Shapes Can Be Forged or Machined

LOOKING for a refractory metal that's forgeable and has good machining characteristics? You may want to consider tungsten in its pure form or alloyed with another metal. It's produced in forgeable, sintered billets and preformed shapes at Firth Sterling Inc., Pittsburgh.

The company is turning out metal that's 99.9 per cent pure, with over 90 per cent theoretical density, says John C. Redmond, director, powder metallurgy research.

Sintered billets, after forging, are machined at room temperature. Curled chips are produced with conventional tungsten carbide tools

• Tungsten alloys are often used where high melting point can be sacrificed to decrease weight.

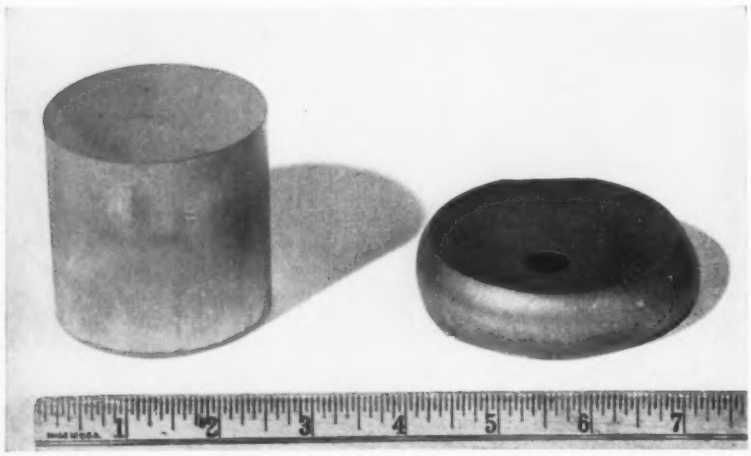
The metal is twice as heavy as iron and has a melting point of 6170° F. It's used extensively in jet aircraft and engines, missiles, and space vehicles. It should gain popularity in radiation shielding, counterweights, gyrorotors, and other commercial applications.

When parts must be light, they're made of a tungsten alloy, instead of the pure metal. Example: A 50-50 alloy of tungsten and molybdenum, produced by the company, weighs less than the pure metal and melts at about 5300° F. It's available in preformed shapes that require little forging.

• The company is developing equipment that will turn out larger billets and hollow shapes.

Tungsten, tungsten-molybdenum, and tungsten-tantalum are available in hollow shapes up to 8 in. in diameter and 4 in. long. Forging billets 4½ in. in diameter and 12 in. long are offered. The company is developing equipment that will make pure tungsten ingots 10 in. in diameter and 20 in. long (weight, 1100 lb).

Conical and cylindrical parts, made to close tolerances, require little forging after they're sintered. And preliminary tests show good machining qualities at room temperature.



Billet (left) forges satisfactorily at about 3500° F. Forged part (right) has been drilled by an electrospark machining process

Special shapes take less forging and less stock is removed in machining

McKee construction force at Inland Steel Company sets a

SAFETY RECORD OF 1,000,000 MAN-HOURS

Working on the most hazardous types of heavy steel mill construction work, a McKee field force of more than a thousand men made this remarkable record at the Inland Steel Company's plant at East Chicago, Illinois. It was accomplished on operations in which a high accident rate is normally expected —pile driving, hydraulic dredging, excavating, foundation construction, steel erection and machinery setting.

The McKee field force made major repairs, replaced foundations, installed new equipment and constructed new facilities while the plant continued to operate. Even though much of this dangerous work was done on the night shift, not a single man-hour was lost as a result of a disabling accident, according to records kept by National Safety Council standards.

This record would not have been possible without complete cooperation between Inland officials, the AFL Craft Unions and McKee personnel. We are particularly proud of this performance because it demonstrates the care and efficiency in engineering and construction with which the McKee organization serves its customers.

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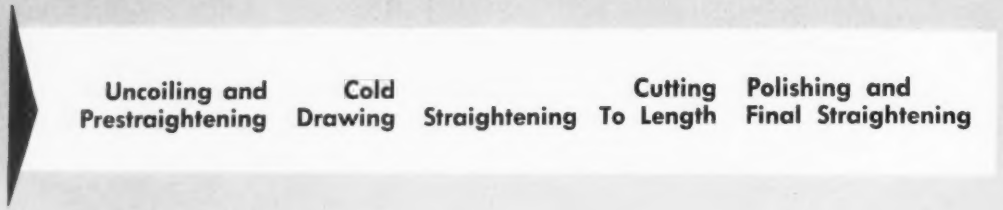
McKEE ENGINEERING AND CONSTRUCTION SERVICES

Automatic Line Makes Bars From Coiled Steel Rods

One man controls these operations:



Continuous, high speed machine, controlled by one man, is a volume producer. Two polishing stages give a superior surface without separate finishing operations

LOOK for increased emphasis on quality in steel products, with some steelmakers offering a superior surface finish at no extra cost. They'll do it by incorporating several forming, machining, or polishing functions in one continuous, automatic operation.

A high speed machine cold draws, straightens, cuts, and polishes coiled rod stock at an eastern steel mill. Developed by Loma Machine Mfg. Co. Inc., New York, it's easily operated by one man.

• **Components for all bar processing operations are electrically and mechanically interlocked.**

The unit turns out cold-finished round, square, hexagon, and rectangular bars, 3/16 to 5/8 in., from coils of carbon, alloy, or leaded steel.

At a line speed of 200 fpm, the machine processes 5 tons of $\frac{5}{8}$ in. round stock per hour, allowing 20 per cent downtime for coil feeding and tool changes.

• **A heavy duty drawbench permits cold reduction of material before it's straightened, polished, and cut in lengths.**

A continuous, 8000 lb pull reduces rod size and upgrades the surface. A five roll, prestraightener uncoils the material and eliminates kinks. Stock is then pulled back and forth through a tungsten carbide die. Reciprocating carriage movements overlap to move the stock continuously. Gripping jaws, built into the carriages, are designed to contact the rod over a wide area, preventing surface marks. Jaws are opened and closed automatically, when carriages are reversed, by an electropneumatic servosystem.

The drawing die, mounted in a cast iron stand, is housed in a spherical die holder. That permits easy adjustment of the die to insure proper stock alignment.

• **Vertical and horizontal rollers, mounted in tandem, straighten the bar as it leaves the drawbench.**

Each of the straighteners has eight rollers, four of which are driven, through gearing, by a common motor. The rollers are adjustable with handwheels; accurate scales insure exact settings.

Rollers are grooved for two stock sizes and can be reversed or changed quickly. They're mounted on overhung shafts. The operator has a clear view of the stock as it's being processed.

• **Straightened rod stock is cut, polished, and stacked automatically.**

A flying shear cuts rods into pieces 8 to 25 ft long. The shear is actuated when the rod strikes a length control limit switch. After cutting, the material is accelerated, leaving space between cut lengths.

Square, hexagon, and rectangular stock is discharged into racks. Round rods are fed into a straightening and polishing machine.

Pairs of rotating discs at each end of the machine give the rod stock a rotating and advancing motion. They apply a high pressure to the stock, condensing and polishing the surface. The 20 to 30 microinch rms surface is said to be equal to that produced in separate polishing operations.

Three bushings bend the spinning stock in all directions, relieving stresses produced in drawing and insuring perfect straightness.

Polished rods are discharged on a slightly inclined table. If they roll freely to the piling racks, they'll pass straightness requirements.

STOCKPILING: Piling up coal reserves in Milwaukee. AMERICAN 300 Series Crawler Crane.

SWITCHING: Moving gondolas, loading steel wire in Illinois. AMERICAN DiesELectric Locomotive Crane.

YARD DUTIES: Sorting steel of all shapes and sizes in St. Paul. AMERICAN 300 Series Self-propelled Crane.

UNLOADING: River traffic flows steadily in St. Louis. AMERICAN 700 Series Pedestal Crane.

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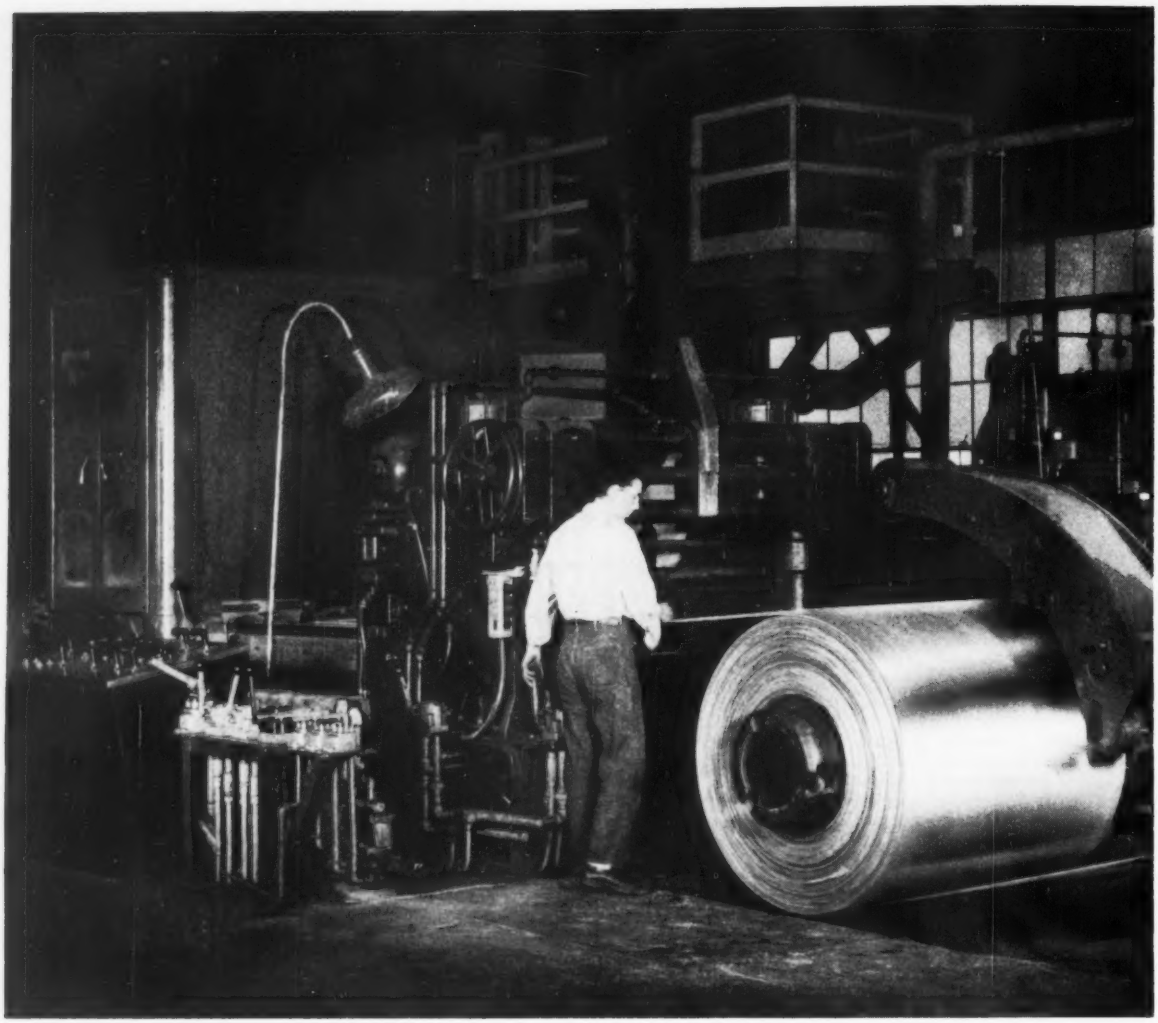

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Adhesive Bonds Metal, Cuts Cost, Ups Output

ASSEMBLING metal parts? Adhesive bonding is saving $56.37 per thousand assemblies for Haydon Div., General Time Corp., Torrington, Conn.

Benefits: The method has eliminated heat distortion, reduced production steps, and lowered rejects. It also helps reduce bimetallic corrosion when dissimilar metals are to be joined.

Haydon assembles timing gears by bonding small pinions to rotor-shafts. The units are used in synchronous timing motors which require small gear trains of high accuracy. The gears are heat treated to provide sufficient hardness for wear resistance.

The previous joining method, in many instances, distorted the gear configuration or affected the hardness of the metal due to the high temperatures involved.

• **Adhesive Properties**—It's a one part, high strength adhesive (EC-1386) with an epoxy base. The maker: Adhesives, Coatings & Sealers Div., Minnesota Mining & Mfg. Co., St. Paul.

The material has good flexibility, high strength, good bending strength, and resistance to cracking or shattering under shock or bend loads, says 3-M. Shear strengths are exceptionally high without the necessity of adding an accelerator or catalyst. The average is about 4670 psi at room temperature and 4630 psi at 180° F.

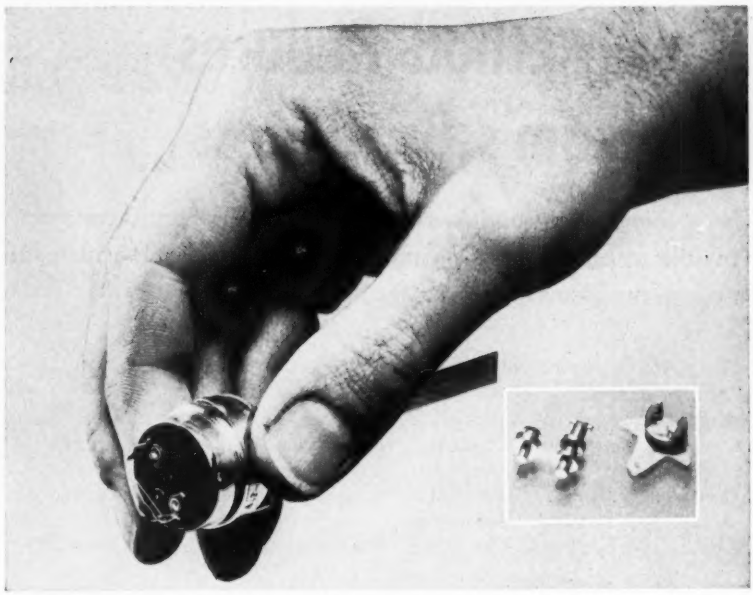
Minnesota Mining claims the nonvolatile material has unlimited working life.

Service temperatures range from −27 to +250° F.

• **Bonding Operation**—The rotor-shaft is first dipped into a special applicator. This applies the correct amount to the shaft.

The pinion is pressed in place on the shaft by a foot press. The assembly is next placed on a drying rack. It's cured for 1 hour in an oven at 350° F. The bond yields shear strengths of over 4500 psi.

No failures occurred during testing at high and low temperatures and at high humidity.



Two miniature diecastings (see inset) are used on the back of this potentiometer in a switch assembly. This forming method plus some effective redesign gave a 53 per cent saving at Clarostat Mfg. Co.

Diecasting Is One Answer For Small Precision Parts

PRODUCING tiny, precision parts? Diecasting them means big savings for Clarostat Mfg. Co. Inc., Dover, N. H., a manufacturer of small switches.

• **Why Diecasting?** — High labor costs meant that the company had to eliminate as many production and assembly operations as possible.

Preliminary studies indicated that automatic, single cavity diecasting might do the trick. A trial run was made, and the diecast stud gave equally good service and cost 40 per cent less. Gries Reproducer Corp., New Rochelle, N. Y., makes the diecastings.

Originally, important moving parts such as the rocker arm, the stud, and the post were made by other methods.

• **Leads to More Saving**—While investigating the possibility of diecasting the center post, Gries discovered that savings were minor compared with those attainable (53 per cent) by making the rocker arm stud and the center post into a single diecasting.

Advantages:

1. Dimensional uniformity from part to part makes automatic assembly possible.
2. Switch performance is improved.
3. Replacing two parts with one trimmed the inventory of parts and cut inspection time.
4. The parts are more rigid.
5. The designer can put metal where it's needed—in areas under stress. This also saves weight. Lighter sections can be used where low stresses are encountered.

Clarostat has been so successful with this design that it has obtained a patent on the diecast rocker arm construction.

New Method Reduces Beryllium's Brittleness

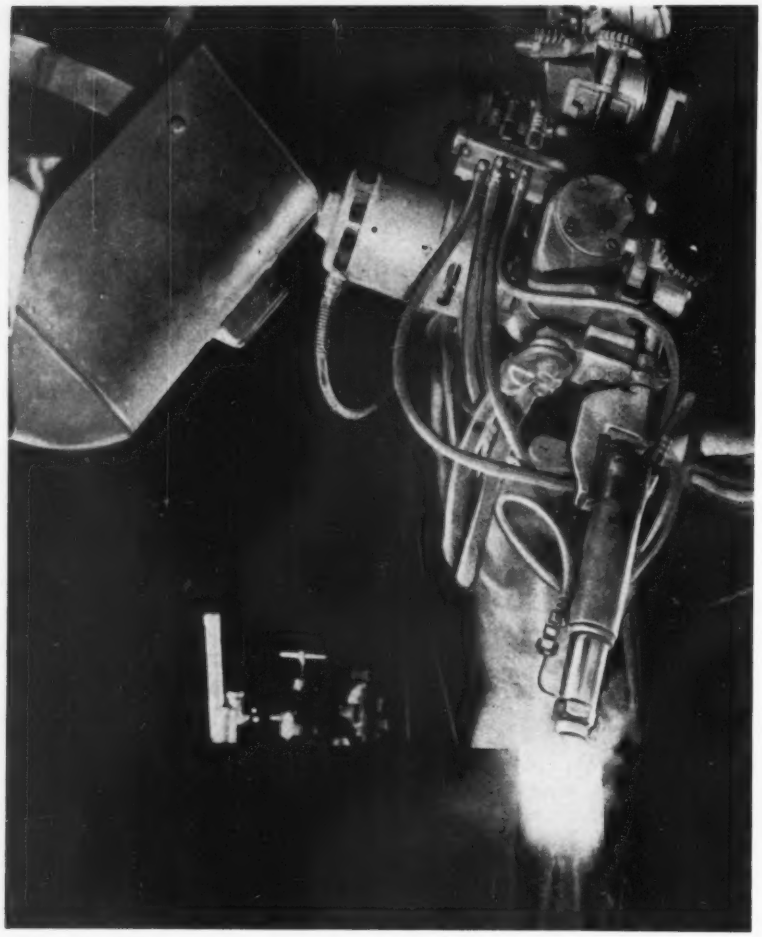
The project was underwritten by an Air Force contract. Possible applications: Solving of aerodynamic and structural heating problems in space flight and re-entry

YOU CAN reduce beryllium's brittleness by controlling its crystal size and orientation during sheet fabrication, says Baltimore Div., Martin Co., Baltimore.

Until now, typical forms, such as castings, forgings, and rolled sheets, have exhibited nonuniform properties and brittleness akin to glass.

The company feels that this stumbling block has been largely removed with the development of sheet material with homogeneous properties.

Brittleness is caused primarily by planes of weakness in the metallic crystal, says the company. Using this information, Martin and Nuclear Metals Inc., Concord, Mass., worked out a successful structure. (It was an Air Force project placed with Martin in the summer of 1957).



TITANIUM IN A J-57 engine needs a lot of high purity argon to keep out atmospheric contaminants during welding. Plastic window operator is welding through forms part of fixturing and improves visibility. Ford Motor Co., Dearborn, Mich., saved $180,000 on this job by switching to liquid argon, says the Linde Co., a division of Union Carbide Corp., New York, which also supplies the storage and distribution facilities

• **Use**—Beryllium in a basic airframe structure may make it possible to solve many aerodynamic and structural heating problems in space flight and re-entry at speeds up to 18,000 miles per hour.

It can also save weight, fuel loads, and trim vehicle size, says Martin. The structures may not require complicated cooling systems to compensate for structural heating caused by friction. Ordinary insulation may be sufficient.

The metal may find its niche in nose cone construction where its great heat storage capacity can be utilized. The company said that beryllium can absorb over twice as much heat as any other structural material under conditions of a given rise in temperature.

• **Properties**—They include a stiffness greater than steel; strength equal to the best aluminum alloys; and a weight equal to the lightest known structural material—magnesium.

• **Other Limitations Remain**—Forming or bending the sheet can be done only within a finely defined band of hot forming temperatures. It can now be joined only with fasteners and cannot be fusion welded, says the company.

Oxygen Process Praised

The basic oxygen process installed by Jones & Laughlin Steel Corp. at Aliquippa, Pa., is a success, says D. R. Loughrey, co-ordinator of steelmaking operations. It's said to be the most economical way to produce low nitrogen steel from the available grade of iron.

The company's confidence in the process has been justified by fast heats, long lining life, and high product quality. Oxygen converters are said to melt higher percentages of scrap than conventional bessemers, when it's desirable to use scrap instead of ore as a coolant.

The one hydraulic press brake built for operators... not maintenance engineers

To all outward appearances many hydraulic press brakes may *seem* alike but that is where the similarity ends. Inside the PACIFIC is the most sensibly simple, patented level control system ever devised . . . only 6 microswitches and 2 relays provide the precise PACIFIC accuracy that no other hydraulic press brake can even remotely approach. Free of lineal variable differential transmitters, electronic amplifiers, photo-electric relays, amplidyne generators, complex hydraulic servo-valves, variable volume pumps and other complicated gadgets, PACIFIC hydraulic press brake can be kept in continuous operation by the ordinary plant maintenance man without the costly services of a professional hydraulic or electronic engineer from some distant factory. PACIFIC can be maintained for pennies per operating hour . . . only a fraction of the cost of the complicated machines.

Costs only 4.4¢ per hr. to maintain . . .

EARNS $7.50 NET PER HOUR

Pacific Hydraulic Press Brake at Atlas Universal Service, Inc., San Francisco, has operated continuously 16 hours a day for 9 years and 27 days with average maintenance downtime of only 5.2 hours per year and a total maintenance expense of 4.4¢ per operating hour.

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Clamping the hydraulic pump on the stand and mounting the test harness takes about 20 seconds instead of the 15 to 20 minutes normally required. The entire testing line can be handled by one man

Test Stand Cuts Manhours, Speeds Pump Testing

YOU can reduce inspection costs dramatically with the right equipment. The potential is illustrated by test stand equipment at Hydraulic Products Div., Clark Equipment Co., Benton Harbor, Mich.

Clark's new division makes aluminum pumps with capacities from 4 to 150 gpm. They operate at pressures up to 2000 psi and at speeds up to 3000 rpm. The hydraulic units are designed primarily for construction, industrial, and aviation equipment.

To prevent customer complaints, all pumps are tested.

One operator can test four units simultaneously on the new stand. (Some other methods require one operator per pump.)

• **The Secret:** Operators clamp the pumps on the stand hydraulically. The main harness that links the ports of the pump to the inlet tank and discharge system can be easily connected. Time required: About 20 seconds.

That compares with 15 to 20 minutes needed with systems where the pumps are bolted down and connected with threaded pipe and fittings or with bolted fitting plates.

• **Cycle**—Once mounted and connected, an electrically controlled scheduling valve takes over and automatically brings the pumps through an operation test.

During this cycle, the operator is only required to observe the flow and torque meters to determine if the pump is within limits. If not, it can removed and another installed at any stage of the cycle. The scheduling valve can be reset to starting position instantly.

John Lauck, division general manager, says the stand was developed to end manual problems with a machine that would pace the operator rather than having the operator pace the machine. The equipment also gives a more accurate and uniform method of testing, says the company.

Valve Maintenance Costs Trimmed by Spraywelding

Spraywelding is clipping 85 per cent off the Navy's exhaust valve maintenance costs, says Wall Colmonoy Corp., Detroit. Savings in three years: About $2 million.

The process applies a fusion bonded hard surface overlay to stainless steel valve stems. That fights wear where stems are in contact with valve guides and helps stop erosion from high velocity combustion gases.

Before the process was adopted, exhaust valves were scrapped after one service tour. Cost: About $40 each, or $720 per engine.

Reclamation cut the cost of overhaul to less than $6 per valve, or about $108 per engine overhaul. Since 1955, the Navy has reclaimed more than 50,000 valves.

• **Process**—Worn valve stems are undercut 0.005 to 0.007 in. to allow for the overlay. The machined surface is blasted with angular steel grit (SAE No. 18 mesh) to provide a good surface for mechanical bond.

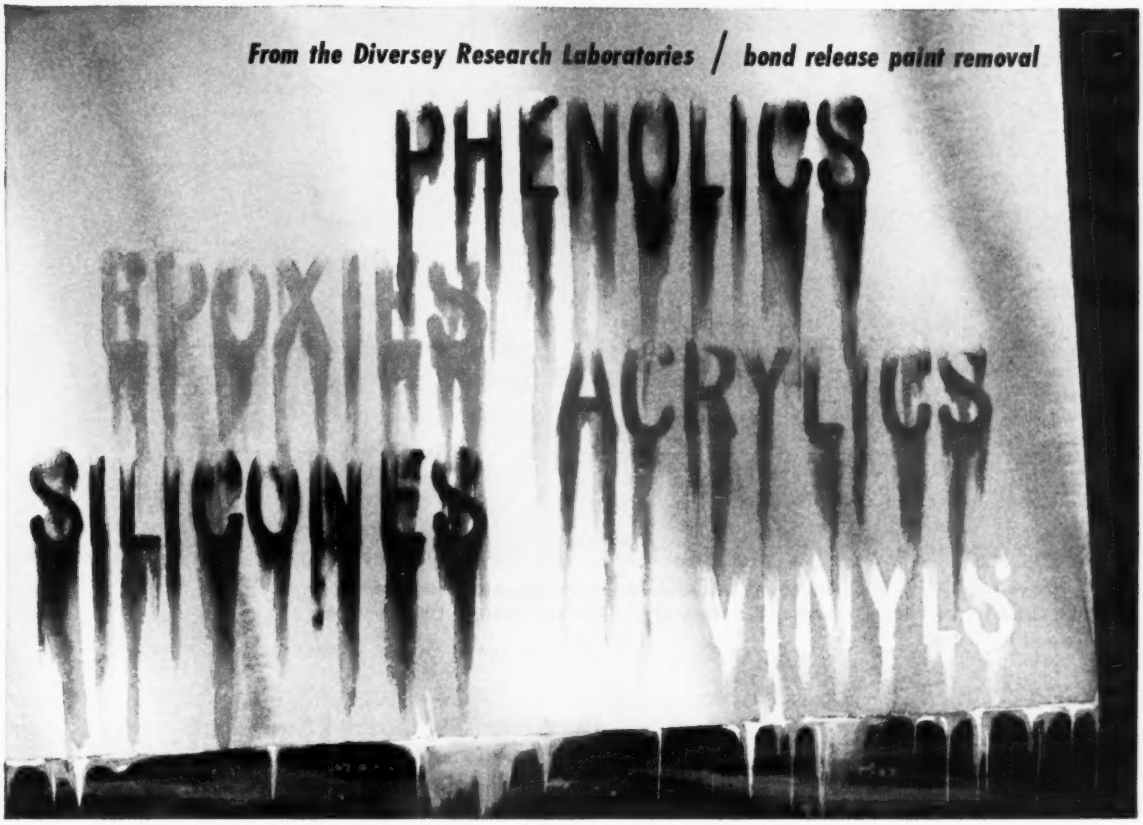
The valve is rotated in a special lathe fixture during the coating process. The Navy sprays a powdered nickel base material containing chromium borides and carbides. The protective overlay is superior to hardened stainless steel, says the company.

An oxyacetylene torch fuses the sprayed alloy to the valve base metal. Rotation of the part keeps the heat uniform and prevents valve stem distortion during fusing. A center type, cylindrical grinder produces finished OD dimensions.

New Patch Cuts Downtime

A new patching material seals defects in the lining of open hearth and electric steelmaking furnaces in less than an hour. It was developed for the Carb-Rite Corp., Chicago Heights, Ill., by the Armour Research Foundation, Illinois Institute of Technology, Chicago.

The material generates its own curing heat. Destructive burning-in, necessary with other patching methods, is eliminated. The patched area is said to have the same structural and chemical properties as the furnace lining.



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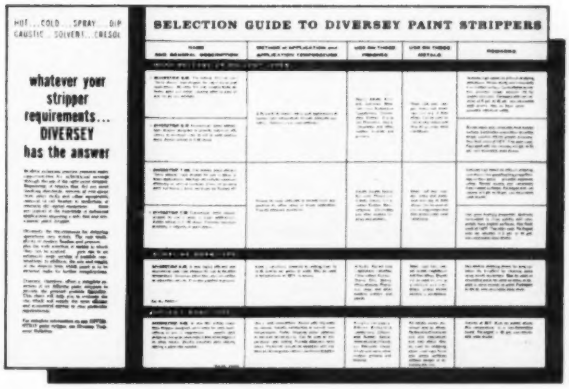
Each DIVERSTRIP paint stripper is formulated for (1) the type of metal or alloy to be stripped, (2) the method of application and (3) the type of finish to be removed. With this complete line to select from, you're always sure of using the fastest, most efficient and economical stripper for your job.

Write now for your copy of Diversey's Paint Stripper Guide. For all your metal stripping, cleaning and surface preparation needs, consult your Diversey D-Man. He has the training and technical experience to solve your problems, cut your costs. The Diversey Corporation, 1820 Roscoe Street, Chicago 13, Illinois.



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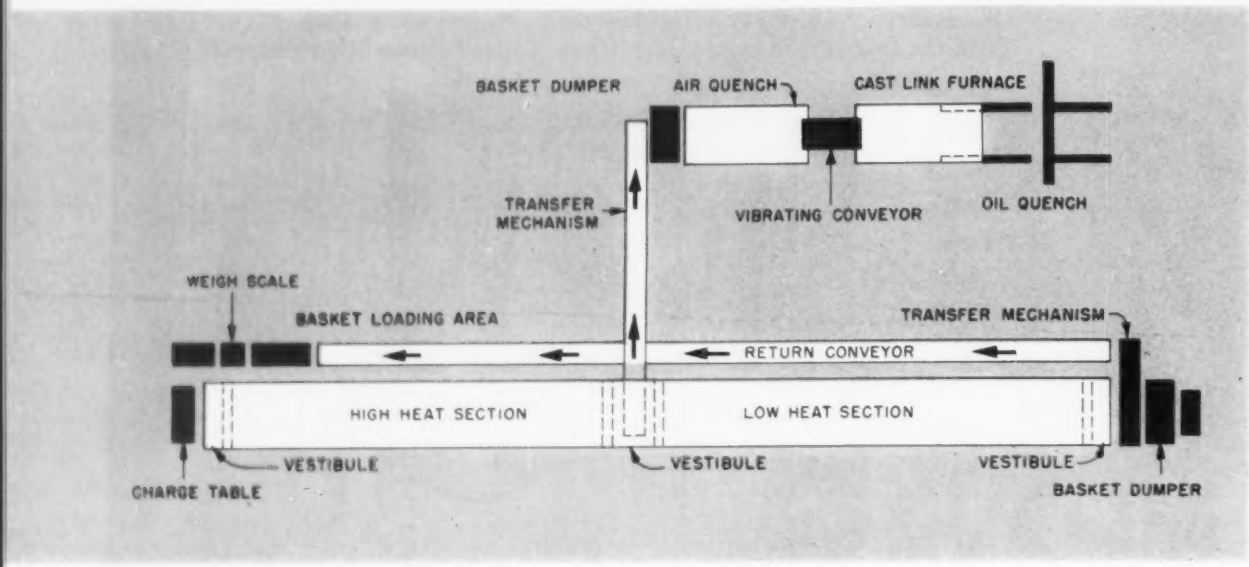


This is the arrangement of the combination annealing and heat treating plant at Marion Malleable Iron Works. It can produce 800 tons of pearlitic monthly, or 1000 tons of pearlitic and malleable

Malleable and Pearlitic Irons Heat Treated Automatically

The equipment has the flexibility needed to produce pearlitic by several processes as well as regular malleable. It reduces annealing costs and boosts product quality

AUTOMATIC annealing and heat treating lines for producing pearlitic and ferritic malleable irons are bringing these benefits to Marion Malleable Iron Works, Marion, Ind.:

Improved product quality.
Decreased annealing time.
Reduced annealing costs.
Lower labor requirements.
Better delivery to customers.

The heat treat setup is the first step in a program for eventually producing 2400 tons of castings a month, including a substantial amount of Grade 35018 malleable. In operation about 17 months, the equipment has a monthly production capacity of 800 tons of pearlitic, or a combination of ferritic and pearlitic irons up to 1000 tons.

• The foundry uses a heat treating cycle with a maximum of 40 hours and a minimum of 32 hours for regular malleable.

Malleable iron is heated to the austenitizing temperature, held at heat, cooled rapidly to 1400° F, and then cooled slowly for 20 hours.

Pearlitic can be produced by different procedures: 1. Arrested anneal, air quench, and draw. 2. Air quench after first stage anneal, reheat, oil quench, and draw. 3. Oil quench after first stage anneal, and draw. 4. Complete malleabilization, reheat, oil quench, and draw.

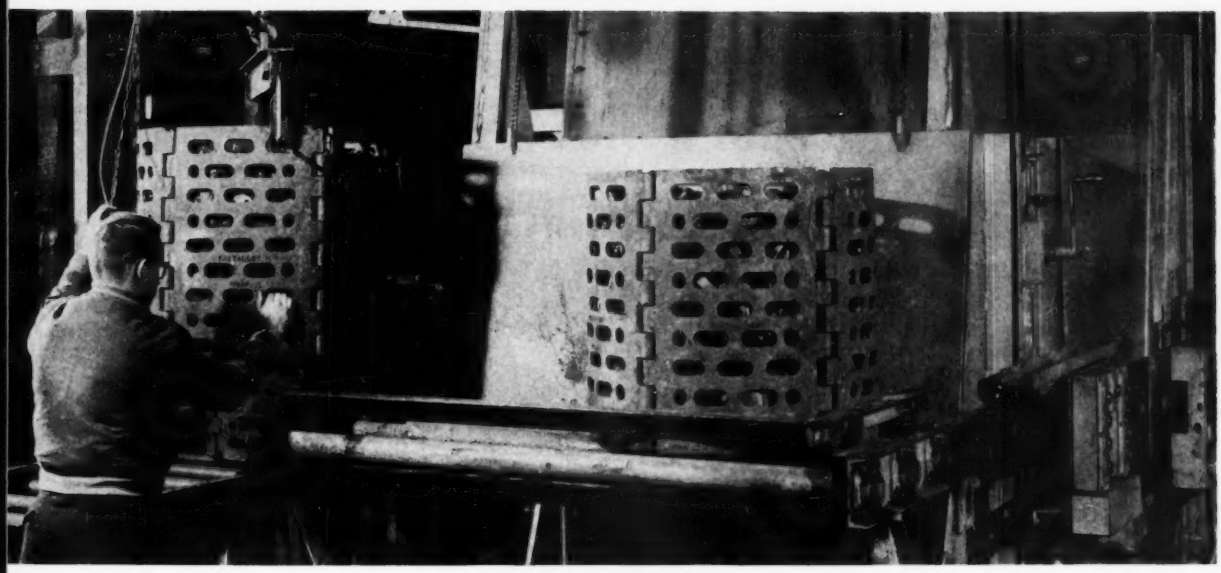
Lawrence E. Emery, chief metallurgist, says heat treating flexibility to provide a choice of those methods, as well as to process regular malleable, was an important factor in selecting the equipment.

Built by General Electric Co., Shelbyville, Ind., it includes an electrically heated, split type, roller hearth furnace with 1000 tons capacity; an 800 ton capacity, gas fired, cast-link conveyor furnace; oil quenching facilities; transfer and dumping mechanisms; and a 4000 cu ft per hour nitrogen gas generator.

• The roller hearth furnace is split into two heating sections to permit processing of ferritic or pearlitic iron.

The heating sections are separated by a water cooled vestibule containing a transfer table.

The first (high temperature) section is used for both ferritic and pearlitic processes. Routes differ from that point, depending on the process chosen: 1.When the pearlitic process is desired, the castings are diverted to an air quench cham-



Loaded baskets are placed on driven rolls at the charging end of the annealing furnace. Every 40 minutes, the furnace door opens and two baskets move into the entry vestibule of the furnace

ber on a transfer table as they leave the high temperature section. 2. When the ferritic malleable process is selected, the castings continue through the vestibule into the low temperature section for controlled cooling.

The split furnace is the first of its type, says Mr. Emery.

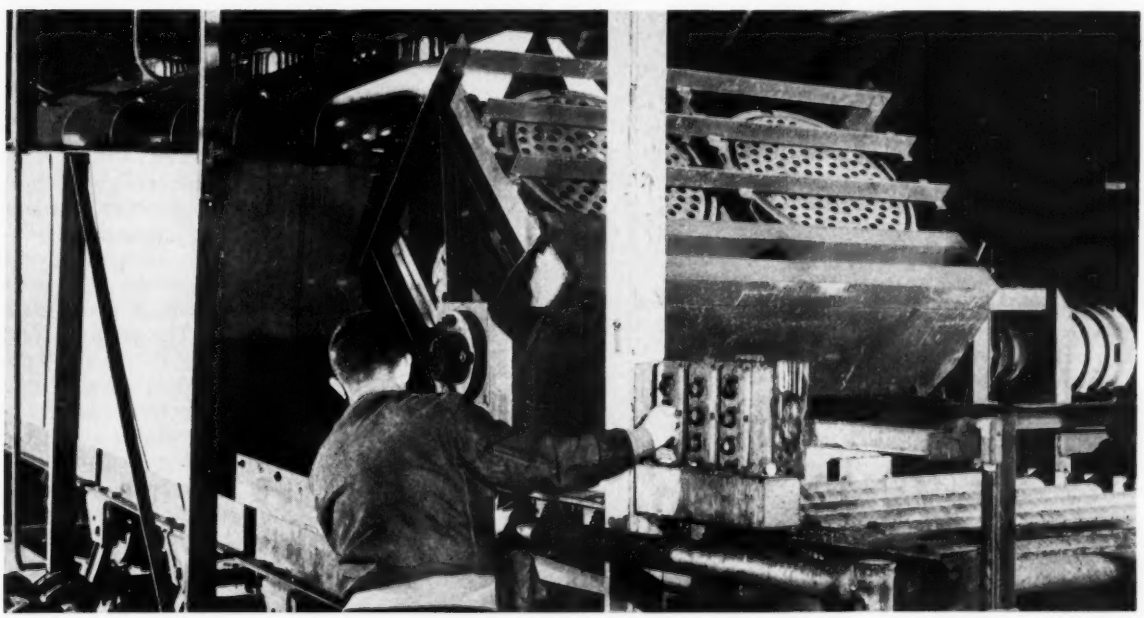
• **Castings are carried through the furnace in alloy steel baskets.**

They are packed carefully to prevent warpage or distortion during annealing, and also to attain a desired density of 1100 lb per basket. Two baskets travel through the furnace side by side.

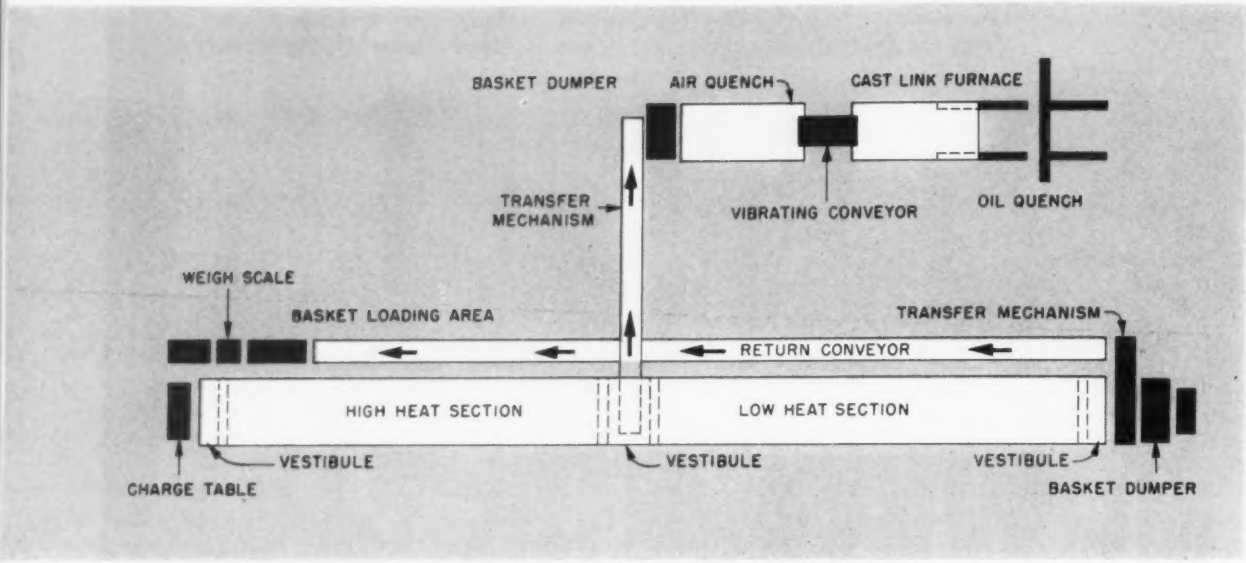
Every 40 minutes, the front door of the furnace opens and two baskets of castings move into the entry vestibule to replace two others which have moved into the high temperature section of the furnace.

• **Castings to be converted into ferritic malleable move through the vestibule into the low temperature section of the furnace where their heat is reduced from 1400 to 1300° F at the rate of 5° F per hour.**

They move into the exit vestibule



A dumper discharges pearlitic malleable castings into the air quenching chamber which cools them to 200° F in 7 minutes



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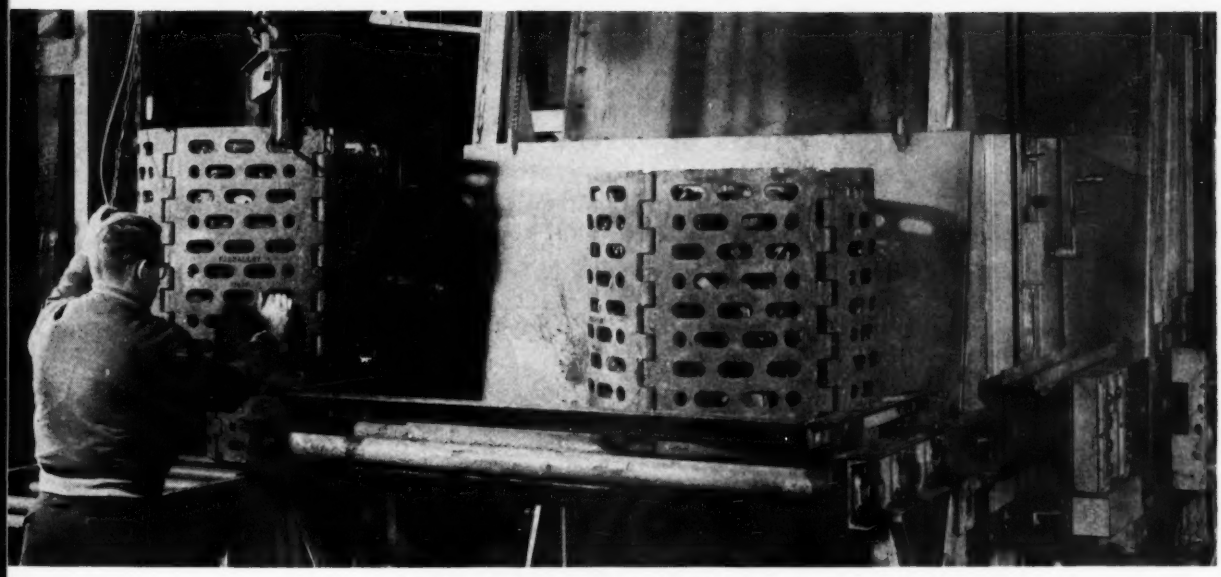

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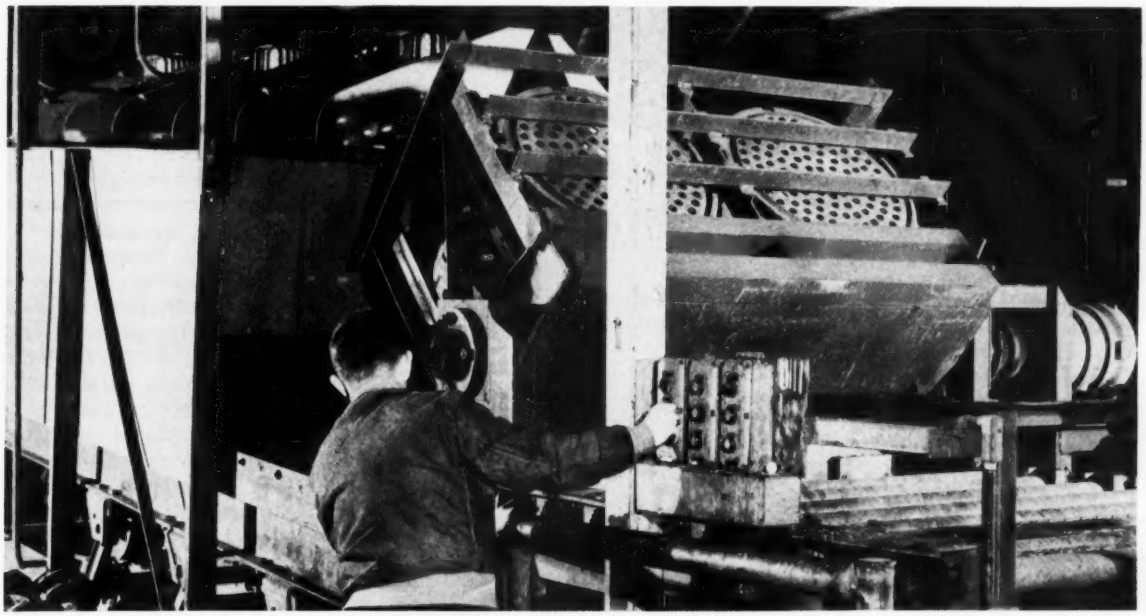


A dumper discharges pearlitic malleable castings into the air quenching chamber which cools them to 200° F in 7 minutes

New Kidde carbon dioxide portables awarded highest U.L. rating!

Belleville, N. J. June 1—A spokesman for Walter Kidde & Company announced here today that six of the company's new portable fire extinguishers have been awarded the Underwriters' Laboratories highest ratings for their respective capacities. To those interested in fire safety, this means that, pound for pound, these new Kidde units have more fire-killing power than any other carbon dioxide extinguishers on the market today.

Available in 10, 15 and 20 pound capacities, in either squeeze valve or trigger models, these power-packed Kidde units feature new hose and discharge horn assemblies, which are responsible for their extra fire fighting ability. This hose-horn combination is also being offered as a replacement unit for existing 10, 15 and 20 pound carbon dioxide units, and when attached will upgrade their effectiveness equal to the new ratings.

For more information on these top-rated Kidde carbon dioxide portables write Kidde today.

Kidde (K Kidde)

Walter Kidde & Company, Inc.
760 Main St., Belleville 9, N. J.
Walter Kidde & Company of Canada Ltd.
Montreal—Toronto—Vancouver

on a roll table and then into a hydraulically operated dumping unit. Here, the castings cool to a black heat and are dumped automatically onto a conveyor from which they are discharged into tote boxes and taken to the finishing area.

After the baskets are emptied, they move onto a short, chain driven conveyor which carries them to the long, power driven return conveyor alongside the furnace which takes them back to the loading area.

• Castings to be converted to pearlitic malleable are carried out of the center vestibule on a transfer table to a hydraulically operated dumper.

The dumper discharges them into an air quenching chamber where they are cooled to 200° F in 7 minutes by three high velocity fans in the roof of the chamber. Cooled castings are discharged onto a short vibrating conveyor from which they can be raked off into tote boxes and taken to a draw furnace, or permitted to pass into the cast-link furnace for reheating and oil quenching.

In the cast-link furnace, the castings are reheated to 1450° F in 1 hour. The belt travels at 13.6 ft an hour and discharges the castings 65 minutes later at a temperature of 1340° F through an oil cooled snorkel tube into the oil quench tank.

From the oil quench, the castings are removed by an apron conveyor and discharged into tote boxes which take them to the draw furnace.

• During the annealing and controlled cooling operations, castings are protected by atmosphere supplied by the dry nitrogen generator.

Gas consumption is about 3000 cu ft per hour. The gas has a dew point of minus 40° F. About 80 per cent is introduced at the discharge door of the high temperature section, and the remainder at the entrance to the low temperature section. Mr. Emery says controlled atmosphere during the annealing process also improves machinability of the castings.

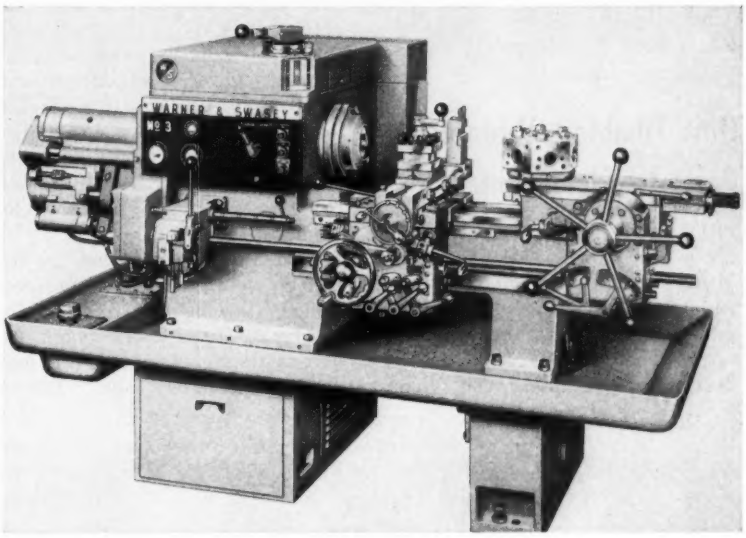
• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Turret Lathe Engineered for High Productivity

BUILT to handle bars up to 1½ in. in diameter, the No. 3 universal turret lathe has been engineered for high productivity and ease of handling.

A single lever control provides spindle speed preselection and instantaneous speed changing in a one-hand operation. Its direct reading preselector dial tells the operator the exact surface speed for each diameter and spindle speed, with numbered clips showing where to find each of the preselected speeds and in what order to use them.

Ample power for heavy metal removal with the newest cutting tool materials is supplied by a 10 hp reversible drive motor. Because the motor is flange mounted, V-belts and motor positioning adjustments are eliminated. The standard, single speed motor provides eight spindle speeds from 90 to 2262 rpm; an optional, two speed motor supplies 16 spindle speeds from 45 to 2262 rpm.



A new hydraulic collet chuck and bar feed mechanism provide the extra support and rigidity needed for the high speed and power of the machine. A touch of the control lever opens the collet and feeds the bar (up to 7 in.). Pushing the bar closes the collet and strips the bar feed head for another stroke.

For more information, *write* Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.

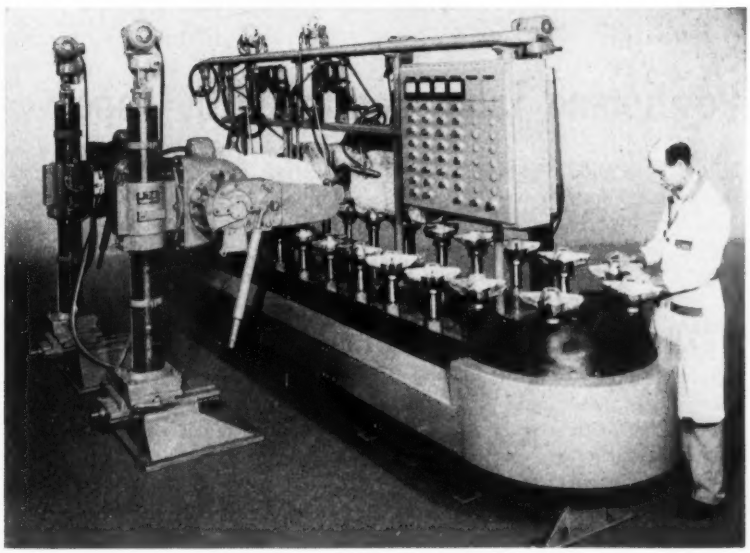
Polishing Machine Is Compact and Flexible

MAXIMUM compactness and operation flexibility are built into a universal, straight line, automatic polishing machine for high production parts.

Basically, the machine consists of an in-line conveyor that moves 1 ft long cast iron platens around the periphery of the unit. A motorized chain drives the platen at feed rates from 4 to 29 fpm. The platens are supported at top, bottom, and sides by rollers.

Polishing or buffing operations are performed by separate adjustable lathes placed around the periphery of the conveyor unit. Each lathe can be provided with rotating buffs, polishing wheels, or abrasive belt heads.

The conveyor is made up of

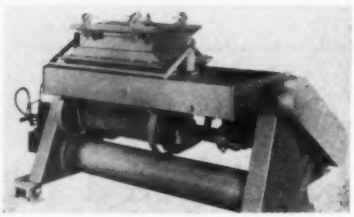


standard 4½ in. sections. The platens can be driven continuously or indexed from station to station. The machine illustrated buffs hub cap spinners.

For more information, *write* Acme Mfg. Co., 1400 E. Nine Mile Rd., Detroit 20, Mich.

Unit Tumbles, Vibrates Parts to Clean, Finish

PRECISION finishing can be done 10 to 100 times faster with the Model 1930E Lorco vibrator than with tumbling barrels of comparable capacity, says the manufacturer. The unit will clean, descale, deburr, radius, fine finish, color,



burnish, or ball burnish metal or plastic parts.

Media, compound, and water are required as with conventional tumbling if a wet process is used. The load of parts and media rotates as a mass. An additional scrubbing action between the load constituents is induced through the controlled vibration.

Both the amplitude and the frequency of vibration can be controlled, allowing the vibrator to do everything from coarse work, requiring severe cutdown, to the most delicate precision jobs. Interior finishes and finishes in shielded areas can be obtained.

For more information, *write* Lord Chemical Corp., 2068 S. Queens St., York, Pa.

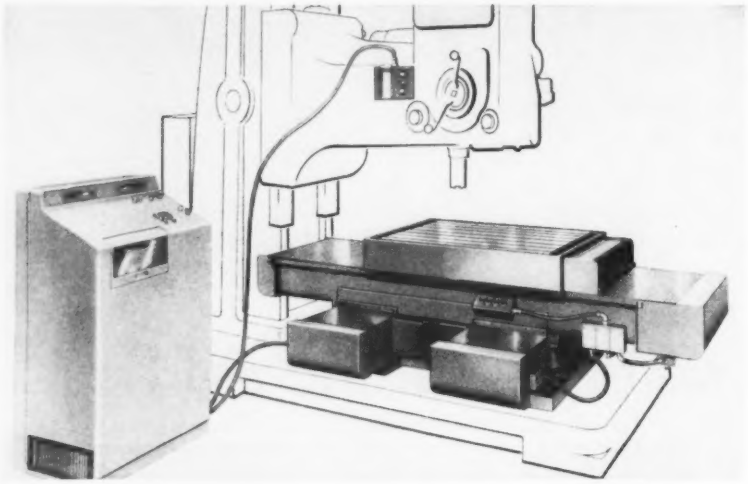
MoS_2 Grease Additive Provides High Coverage

A DISPERSION of molybdenum disulfide, designated dag 208, provides greater coverage than powder at no increase in solids content, says the manufacturer.

Greater effectiveness can be obtained at a lower solids content, extending the range of applications to closer tolerance mechanisms. Photomicrographs show that the finer particles in the prewetted dispersion provide 80 per cent greater hiding power than powder. The ultimate result is more coverage per dollar.

Other advantages of the dispersion include consistent uniformity, and ease of handling, measuring, and blending which provide additional savings in time and labor.

For more information, *write* Acheson Colloids Co., Port Huron, Mich.



Positioning Table Controlled by Tape

HERE is a table designed to position up to 5 tons of work for drilling, reaming, boring, tapping, or layout at speeds of 360 in. per minute at accuracies to within 0.001 in., and with repetitive accuracy to within 0.0005 in.

Numerically controlled, the table offers the cost saving features and accuracy of tape input at a price competitive with standard spacing tables, says the manufacturer. The table can be operated by punched tape or a manual keyboard.

Positioning instructions can be punched into ⅞ or 1 in. tape on a standard preparation unit. Five channel tape can also be used. Since the system works on a decimal system, the operator needs no conversion tables. If work prints call for holes or locations other than those punched in the tape, the operator can assume control of the table and insert additional instructions from a keyboard on the console.

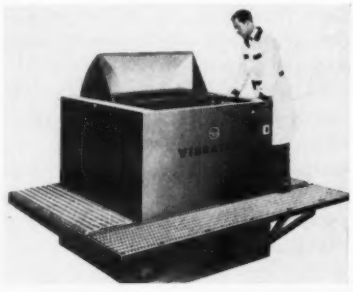
For more information, *write* Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.

Machine Cleans, Finishes With Vibrating Abrasive

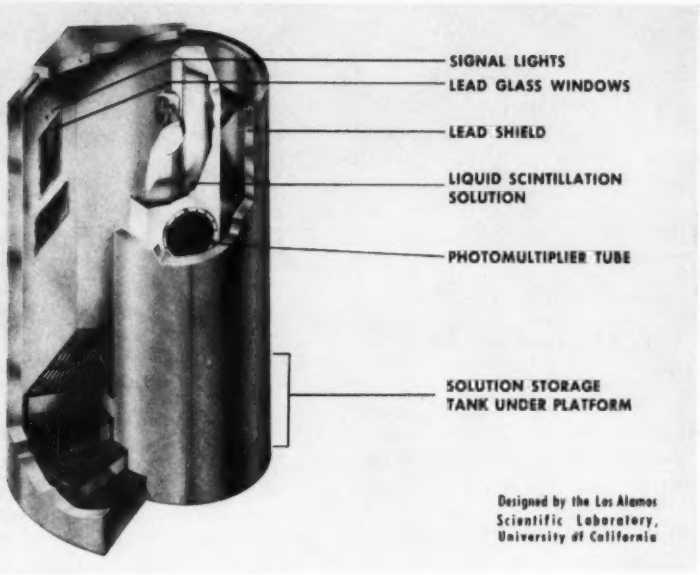
PARTS can be finished in the Vibratron at production rates up to 1000 per cent greater than is possible with conventional barrel finishing techniques, says the manufacturer. It will clean, descale, deburr, radius, fine finish, and color parts.

Complex cast, forged, stamped, and machined parts with shielded and internal surfaces can be handled. The process is economical: Only a few ounces of compound are necessary to do an effective job.

The vibrating action extends the



16 TONS OF LEAD



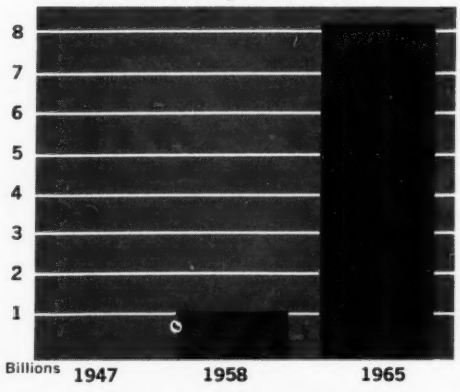
Provides The Shielding In This Walk-In HUMAN RADIOACTIVITY COUNTER

The need for instruments that can rapidly and accurately determine very small amounts of radioactivity in people and foodstuffs is urgent. The concern over world-wide fallout from nuclear weapons testing and the problem of efficient monitoring as part of power reactor development emphasize this need. In both cases, large numbers of people are potentially exposed either directly or through the wider, indirect hazard of contaminated food.

This radiation counter was part of the United States exhibit at the Geneva Conference of Peaceful Uses of Atomic Energy. The 16 tons of lead provides a thickness of 3 inches of shielding in all directions. The shape of the shield resembles a snail shell. With this design, there is no direct "line of sight" from outside into the very sensitive gamma-ray counter . . . and eliminates the inconvenience and expense of a heavy door.

Lead, having the best shielding property of all common metals was chosen to provide maximum protection from gamma-rays with minimum weight and floor space. The metal's relative availability and economy was another factor. The cost of the vital 16-ton shield amounted to about 10% of the Geneva counter's total cost. The importance of this application and its potential is exemplified by the chart shown below.

ESTIMATED CUMULATIVE EXPENDITURES FOR REACTOR, EQUIPMENT, FACILITIES



Source: NUCLEONICS, September, 1957, p. 33

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The Largest Producer of Lead in the United States

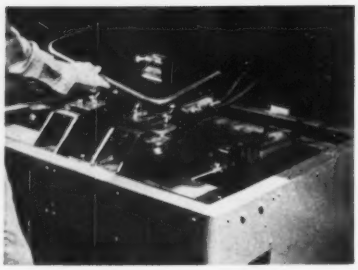
work zone through the entire abrasive mass. Vibration is induced by motor with a system of integrally mounted eccentric weights. The motor is mounted directly onto the bottom of the vibrating tank.

For more information, *write* Roto-Finish Co., Kalamazoo, Mich.

This Machine Makes Two Bends at a Time

TWO 90 degree bends can be made in 1½ seconds with the Costello Double Header bending machine. The unit has two independent bending heads.

A tube is laid into the clamp dies. The operator presses a pedal. Automatically, the form dies swing forward, lock into bending position, and clamp the tube. As soon as the dies are locked, the bending arms automatically rotate to predetermined bend angles. The operator releases the pedal, and the cycle reverses.



For bending two tubes at a time, the length between centers of the bend radiuses is adjustable from 7 to 28 in. Each bend angle is independently adjustable from 0 to 100 degrees. The machine bends any size tube up to ¾ in. OD.

For more information, *write* Costello Engineering Co., 6547 West Blvd., Inglewood, Calif.

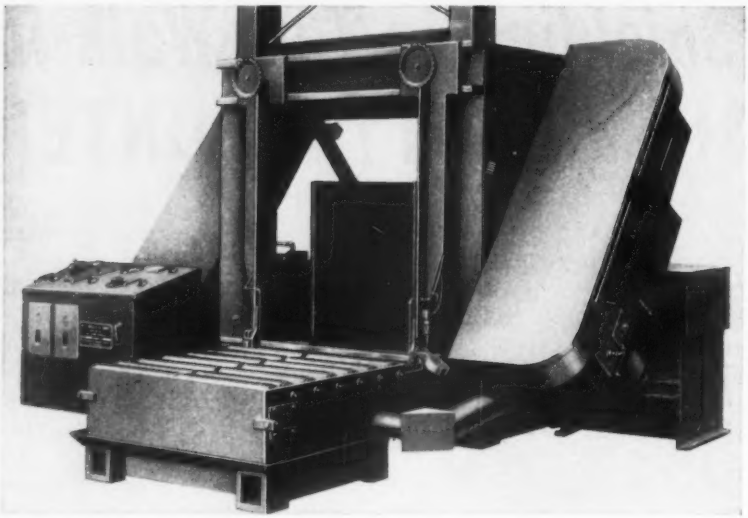
Electric Hoists Feature Balanced Parts Design

IN THE new Balanced Design Hevi Lift line of electric hoists (equipped with wire rope), each part of a hoist motor, gear case, drum assembly, and brake is balanced or matched against each other for strength, temperature, and performance characteristics. No single part of the hoist can be said to be the limiting factor on the over-all performance of the unit.

The line includes hoists with lifting capacities from 2000 to 50,000 lb, with lug, hook, plane, hand geared, or motor driven trolley mountings, or low headroom arrangements, as well as base, wall, ceiling, and deck mountings.

Lifting speeds range from a low of 10 to 100 fpm. Height of lifts ranges from 15 to 100 ft.

For more information, *write* Harnischfeger Corp., Milwaukee 46, Wis.



Bandsaw Cuts Die Blocks, Structurals

LARGE die blocks, solids, and structural steels can be cut with the T-40 machine. It also cuts aluminum, carbon, plastics, and other materials. It has a capacity of 40 by 40 in.

The machine is built in two models, light and heavy. The light model is designed to cut nonferrous materials and nonmetallics. It has a variable speed drive, large truss and cross braced columns that make it rigid and free of vibration. A calibrated valve sets the desired feed pressure and maintains unvarying feed throughout the cut.

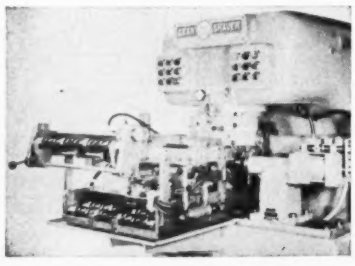
The heavy model has a powered conveyor table built through the base to permit easy and accurate positioning of heavy materials. Proper blade tension is maintained hydraulically. There is a powered conveyor for removing chips. A direct reading tachometer shows the blade speed in feet per minute.

For more information, *write* W. F. Wells & Sons, Three Rivers, Mich.

Loader Handles Long Parts On Gear Finishing Units

LONG, slender parts such as automotive camshafts, can be automatically loaded in gear shaving or honing machines with a new Red Ring device.

Parts are checked for oversize by a pair of gaging master gears as the operator loads the inlet magazine. In the magazine, the gears are spaced apart (to avoid nick damage) by a series of linkages that advance each shaft part as one is fed into mesh with the cutter or honing



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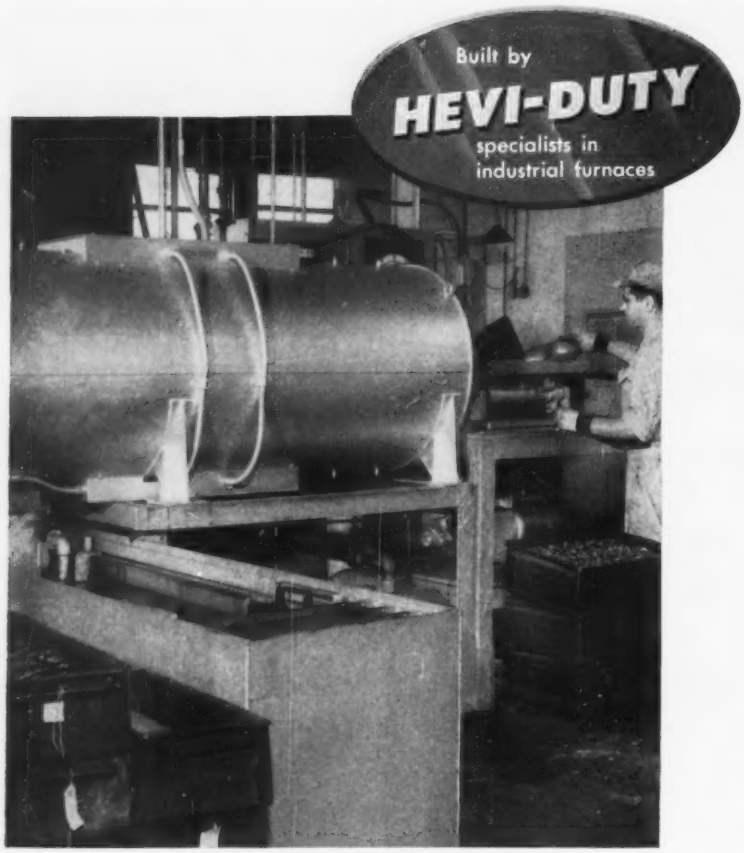

Talk about performance...
production tripled...rejects eliminated ...operating costs cut 50 percent

This is the kind of performance Fred Heinzelman & Sons, New York's oldest heat treat shop, likes to talk about. Carl Heinzelman says, "We like the operating simplicity of our Hevi-Duty Shaker Hearth Furnace as well as its excellent temperature uniformity. The uniform quality of the work it turns out has eliminated rejects."

But improved quality is only half the story. Parts are fed onto the hearth and progress through heat and quench cycles automatically. This eliminates jig and wire time and enables them to step up production from 20 lb an hour to 60 lb an hour. At the same time, operating costs per unit of production have been cut in half.

Parts processed in this furnace are springs, washers and screw machine parts. They are treated under protective atmosphere at temperatures varying from 1450° F. to 1850° F. and quenched in oil. All parts come out at maximum hardness for each metal.

For more information on the performance of Hevi-Duty Shaker Hearth Furnaces, write for Bulletin 1057.

- Industrial Furnaces electric and fuel
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HEVI-DUTY ELECTRIC CO.
Milwaukee 1, Wisconsin

NEW PRODUCTS and equipment

tool for the finishing operation.

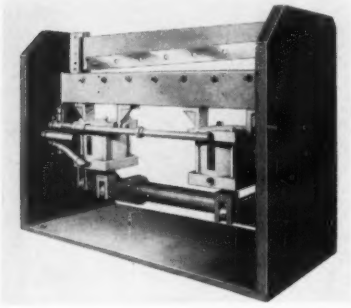
When a part is in finishing position in mesh with the gear-shaped tool, an air-powered steady rest is raised to contact one of the bearings in the middle of the shaft. The steady rest has a positive stop and is locked into position while the gear teeth are being finished.

For more information, *write* National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich.

Air-Powered Strip Shear

THE Down-Cut Strip Shear cuts strip from 24 to 84 in. wide and is effective on material up to 3/16 in. thick.

The unit operates on any air pressure source having 60 to 100 psi. It comes with air filter, air lubricator, muffler, and self-contained hydraulic shock cylinder.



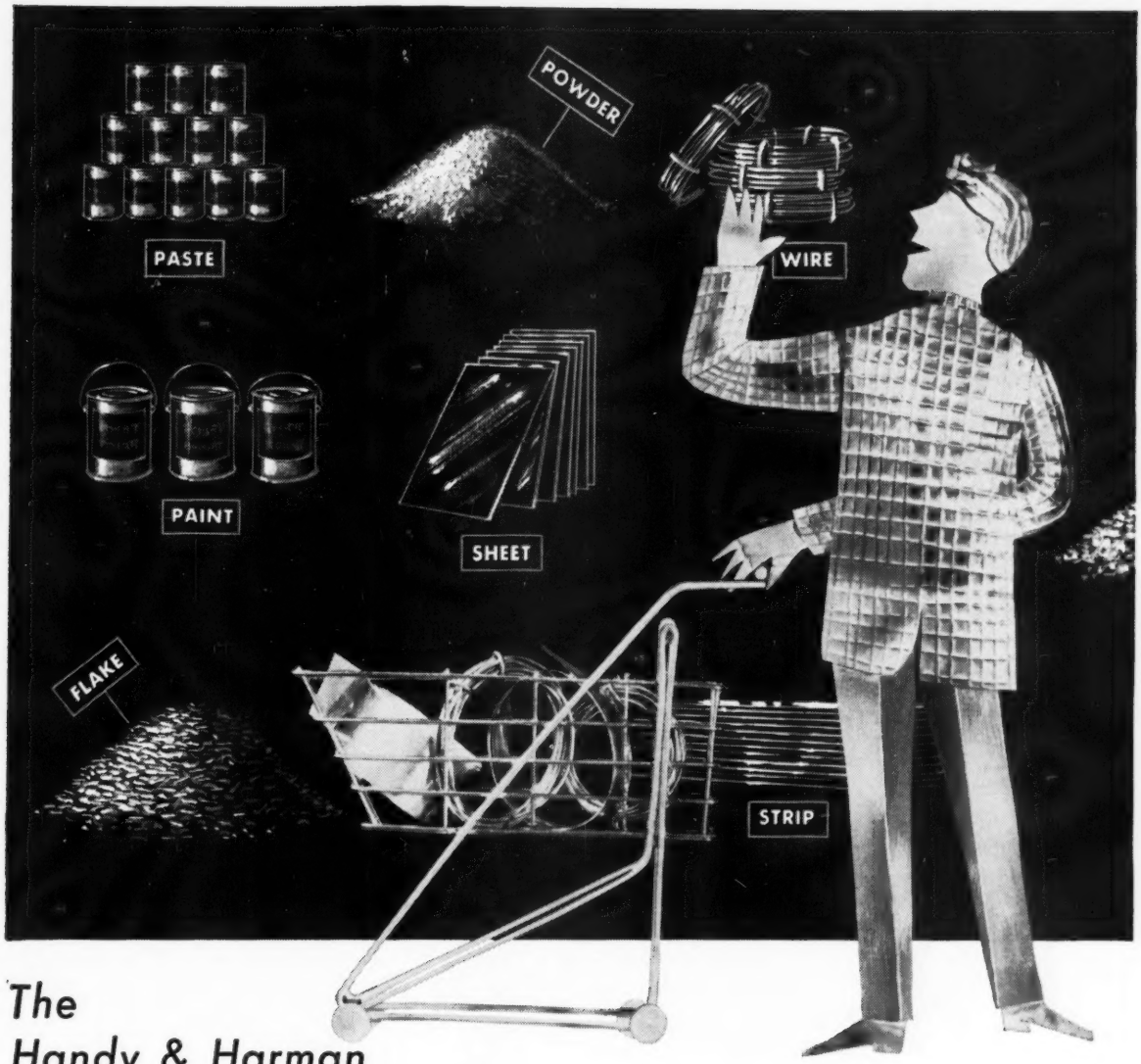
Air-operated shears of this type require no foundation, and require practically no maintenance over long periods of operation.

For more information, *write* Curry Air Shear Corp., 3519 Bigelow Blvd., Pittsburgh 13, Pa.

Molding Machine Has High Squeezing Power

BETTER compaction of green sand resulting in better molds, faster production, and lower cost are the advantages claimed for the Model 9646 Jolt-Squeeze-Rollover draw machine.

The unit has a jolt capacity of 1500 lb and squeeze capacity of 21,000 lb on standard 80 psi line pressure. The high squeeze pressure is achieved by utilizing the



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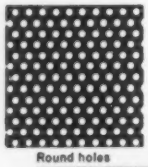
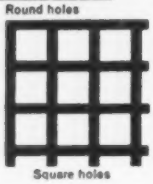


Round holes

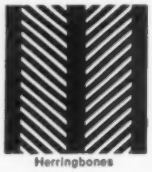
Whenever—wherever—your products require perforated materials, you will find the pattern and open area "just right" for that custom-look in the vast selection of H & K existing dies.

Modern facilities and H & K experienced craftsmanship, enable the perforating of practically all metals, wood, compositions and plastic. Perforated materials can be furnished in sheets, coils, rolls or plates. Fabricating services include shearing, rolling, welding and forming.

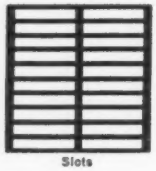
Illustrations shown in reduced size



Square holes



Herringbones



Slots

Oblong holes

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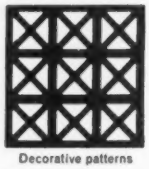
H & K fills every need for perforated materials. Appropriate perforated metals can be ordered with color anodized, brushed and lacquered, painted, chrome plated, baked-on, or other special finishes.

Many patterns in steel sheets (industrial or decorative) are in stock at our warehouses. Send for H & K Stock List Brochure.



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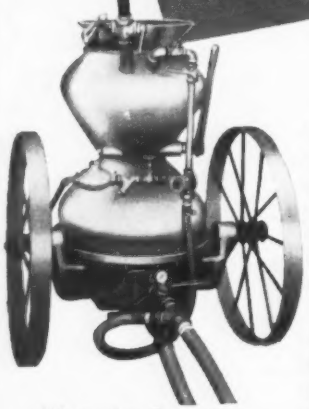

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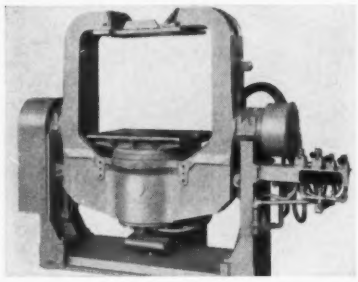


areas of the jolt and squeeze pistons in combination. It has a 12 in. pattern draw and 12½ in. squeeze stroke.

The machine has a power rollover cylinder for smooth rollover action and a heavy duty power brake that makes it easy for the operator to position the jolt table at intermediate points for easy, time-saving flask loading.

For more information, *write* SPO Inc., Grand Division Avenue, Cleveland 25, Ohio.

Reach Type Electric Truck Stacks in Narrow Aisles

WITH performance characteristics and operating features which enable it to do as much work as a full-size counterbalanced fork truck, the NR-40 can stack 48-in. long loads at right angles in a 7 ft wide aisle.

The truck has hand operated power brakes, power steering, dual operating controls, two wheel drive, and automatic fork tilt.

Performance characteristics include efficient battery utilization, smooth acceleration, high stability,

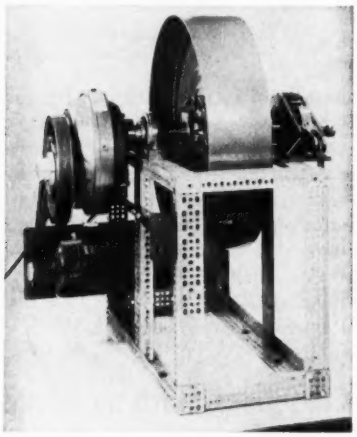
and fast travel and lift speeds. Capacity is 4000 lb at 24 in. load center.

For more information, *write* Industrial Truck Div., Clark Equipment Co., Battle Creek, Mich.

Speed Reducer Has Device To Take Up Belt Stretch

AUXILIARY motor rails for belt takeup are unnecessary with the Offset Shaft-King speed reducer.

The inputshaft of the unit is offset from the output hub. This design provides a simple means of taking up belt stretch from the primary drive. Adjustable torque arms rotate the reduction unit about its outputshaft and increase or decrease the center distance between belt pulleys.



The reducer is available in two reduction ratios (13 to 1 and 20 to 1) and six capacities to handle fractional to 40 horsepower drives.

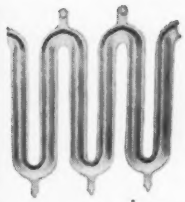
For more information, *write* American Pulley Co., Philadelphia, Pa.

Automatic Unit Can Feed, Drive 60 Screws a Minute

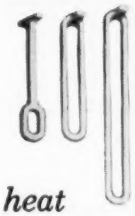
TWENTY-SIX different sizes and types of screws can be automatically fed and driven without any change of fittings at speeds up to 60 per minute with the Powasert automatic screw driver, Model B.

It will handle all wood screws from ½ to 1¾ in. in gages 6 to 10. Round, flat, and oval headed screws, as well as some pan, truss,

SHELL MOLDED PARTS



corrosion resistant



heat resistant

abrasion resistant

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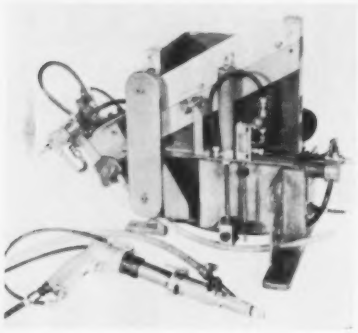


and binding head screws can be driven with the unit. Slotted or cross-recessed drives (including Phillips, Frearson, Reed, and Prince) can be handled also.

Because the Powasert unit can be used anywhere within a 12 ft radius of the feeder-separator, assembly line production can be made more flexible. Operating range can be extended further by mobile mounting of the feeder-separator unit.

Torque control is balanced to eliminate head stripping. The bit can't slip off the head to mar the work surface.

For more information, *write* United Shoe Machinery Corp., Boston 7, Mass.

Ultrasonic Flaw Detector

CONVENIENT size and weight for field testing is combined with the flexibility required for laboratory use in the Sonoray, an ultrasonic test instrument.

Both flaw detection and thickness measurement are possible with the unit, which uses the pulse-echo detection principle. The instrument can be used for contact or immersion work. Equipped with handles which fold up and over the cabinet, the unit is easily carried by one man.

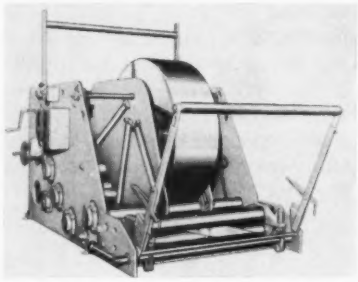
A distance marker, which can be shifted laterally, has been built into the unit. Instead of a square marker, the instrument shows a pyramid, which makes weak signals, or those at critical points, much easier to detect. The pyramid marker is especially useful for determining flaw location, when ultrasonic pulses are beamed into the material at an angle.

For more information, *write* Branson Instruments Inc., 40 Brown House Rd., Stamford, Conn.

Heavy Duty Coil Cradles

GREATER operating convenience, increased strength, and rigidity of frames have been built into the redesigned Benchmaster Koil Kradles.

Improved width capacity has been obtained between guide plates, yet over-all outside dimensions have been reduced. Side plates are now



joined in a rigid, welded structure employing heavy wall tubes as transverse members. The tubular construction eliminates racking and torsional deflection of the frame, and retains alignment of bearings in which rolls are mounted.

For more information, *write* Benchmaster Mfg. Co., 1835 W. Rosecrans Ave., Gardena, Calif.

Centerless Machine Grinds Inner Races of Bearings

INNER races of miniature bearings as small as 0.040 in. can be ground to 0.00015 in. tolerance and 5 microinch finish in 15 seconds with the Model 090 Centri-Matic.

Work handling capacity of the new machine is 0.050 in. practical minimum outside diameter of work. Estimated bore grinding cost is 2.7 cents per race (at a total operating cost of $7.50 per hour).

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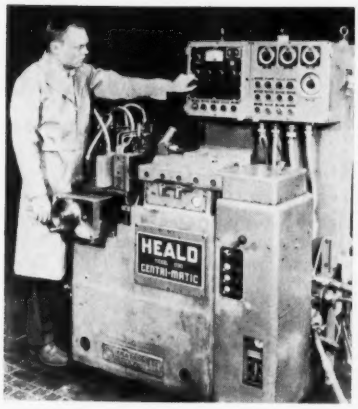

mond relationship and compensating for drift.

For more information, *write* Heald Machine Co., 9 New Bond St., Worcester 6, Mass.

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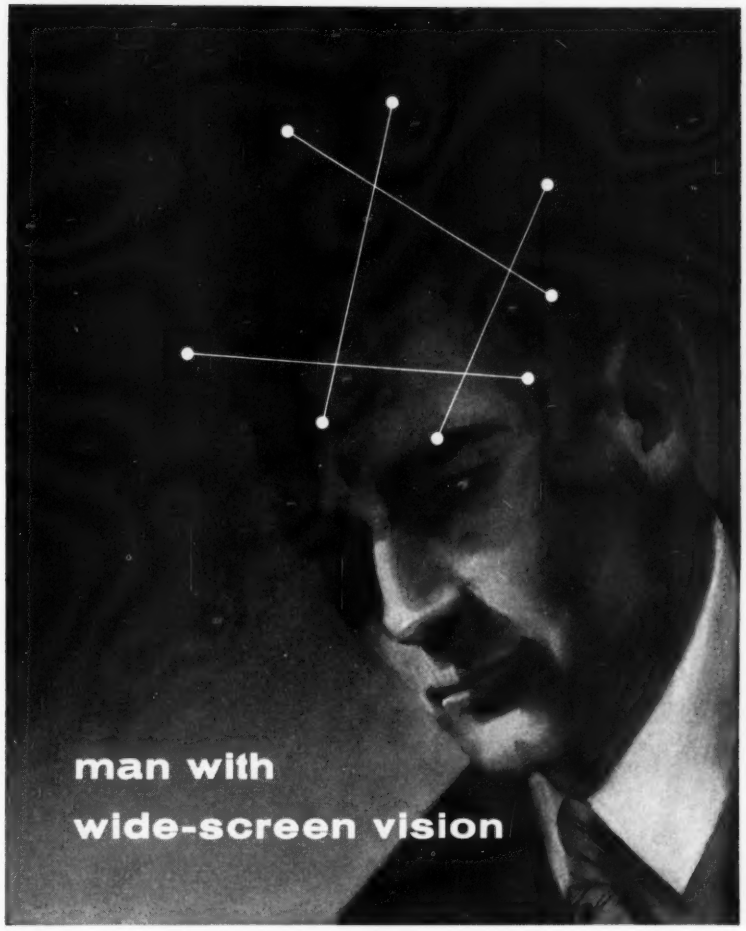
The Eager Beaver pull-down broaching machine is midget size rated: 1½ ton at 5 ft per minute broaching speed and ¾ ton at 10 ft per minute. The unit has a 12 in. stroke.

Although compact, it is built for precision broaching. Such parts as lock cylinder barrels, various slots, and other internal applications are broached easily. In certain instances, external and surface broaching can be performed satisfactorily on the machine.

For more information, *write* La-Pointe Machine Tool Co., Hudson, Mass.



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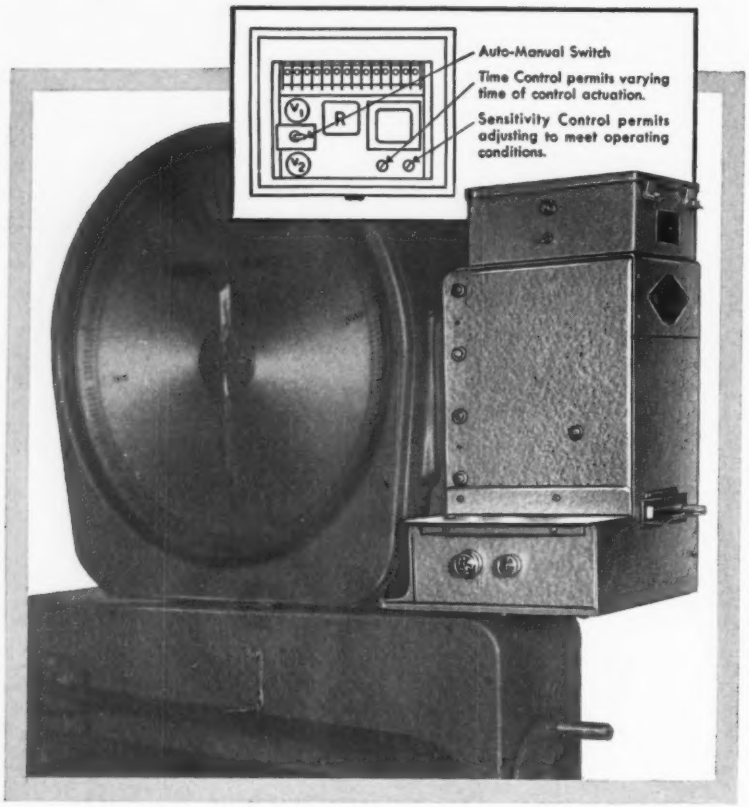
NEW Fairbanks-Morse Electronic Weight Detector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Prevents incorrect weighing . . . stops costly errors!

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To completely automate your weighing—to be sure that your weights are correct—to protect yourself by completely policing your entire weighing operation—contact your nearby Fairbanks-Morse Field Engineer, or write directly to Fairbanks, Morse & Co., 600 South Michigan Ave., Chicago 5, Illinois for complete information.

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NEW Literature

Write directly to the company for a copy

Storage Rack Design

"Be Your Own Storage Rack Expert" explains how you can put together storage racks and production fixtures with a minimum of cost, time, and effort. Tube-Strut Corp., 2960 Marsh St., Los Angeles 39, Calif.

Data Sheet on Yttrium

Many characteristics of yttrium—thermal properties, crystal structure, electrical properties, and corrosion data—are included in a data sheet. Research Chemicals Div., Nuclear Corp. of America, P. O. Box 431, Burbank, Calif.

Filter, Insulation Material

An 8 page brochure describes Troyfelt, a synthetic nonwoven material that can be blended for many uses. Troy Blanket Mills, 200 Madison Ave., New York 16, N. Y.

Rhodium Electroplating Processes

A 20 page booklet tells when, where, and how to use rhodium electroplate to improve product performance and reliability in many industrial applications. Sel-Rex Corp., Nutley, N. J.

Precision Mechanical Finishing

A 30 page catalog outlines various types of finishing and abrading processes, such as grinding, deburring, descaling, and polishing. Roto-Finish Co., 3700 Milham Rd., Kalamazoo, Mich.

Prealloyed Metal Powders

A booklet lists many types of metal powders and their applications. Powder Metallurgy Dept., Vanadium-Alloys Steel Co., Latrobe, Pa.

Ceramic Fiber Materials

Fiberfrax ceramic fiber insulating materials are described in a series of technical data sheets. Advertising Branch (PM299), Carborundum Co., Niagara Falls, N. Y.

CO_2 Welding of Steel

A 24 page booklet, ADE 882, covers Aircomatic welding of mild steel and low alloy steels with carbon dioxide (CO_2) shielding gas. Air Reduction Sales Co., division of Air Reduction Co. Inc., 150 E. 42nd St., New York 17, N. Y.

Nickel Tubing Data

"The Nickel Family of Small Tubing," lists chemical composition, physical constants, and mechanical properties of four types of seamless nickel tubing. Superior Tube Co., 1585 Germantown Ave., Norristown, Pa.

Cobalt Nickel Spring Alloy

A 26 page handbook gives technical facts on Elgiloy, a cobalt nickel spring alloy. Abrasives Div., Elgin National Watch Co., Elgin, Ill.

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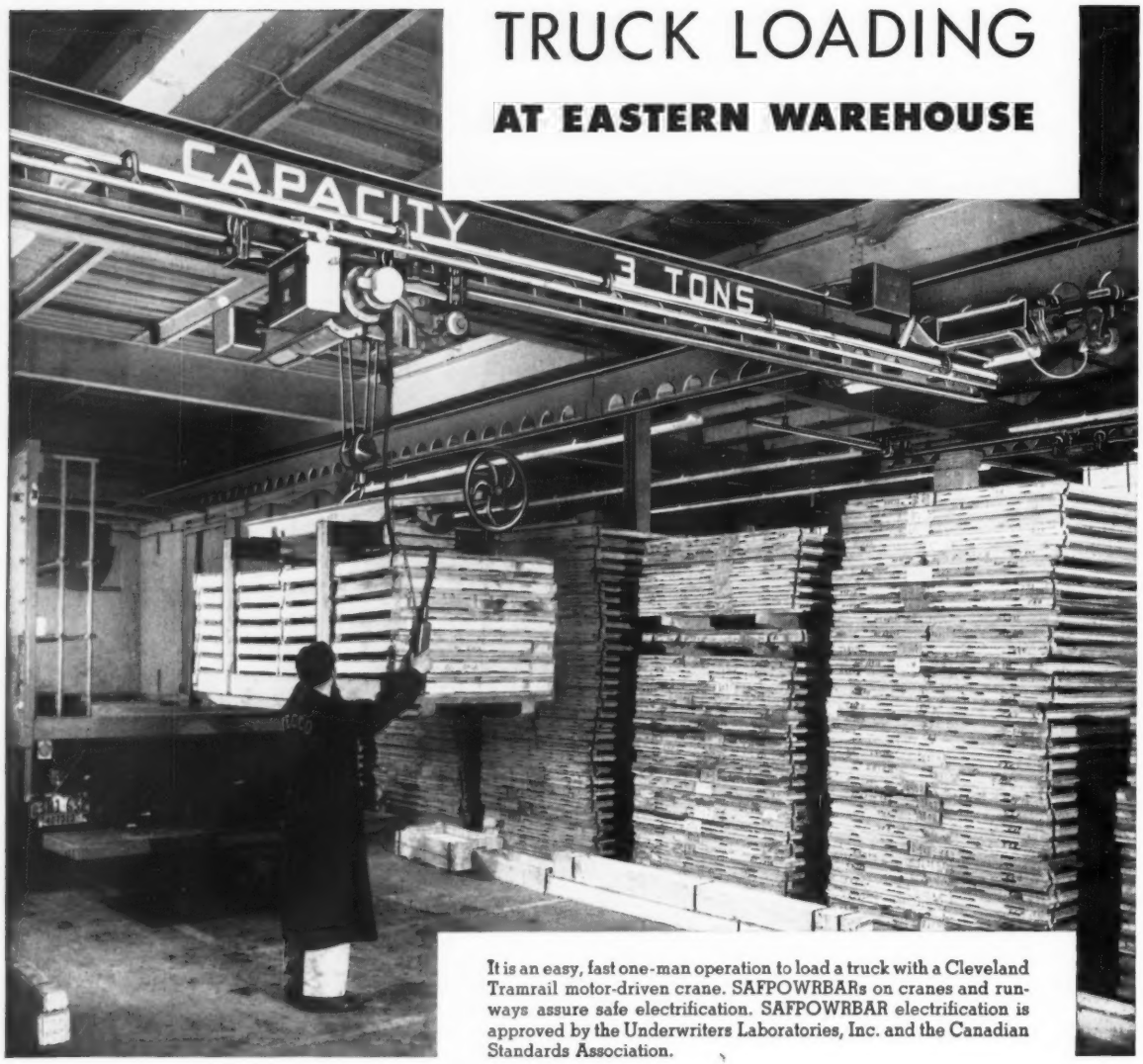

It is an easy, fast one-man operation to load a truck with a Cleveland Tramrail motor-driven crane. SAFPOWRBARs on cranes and runways assure safe electrification. SAFPOWRBAR electrification is approved by the Underwriters Laboratories, Inc. and the Canadian Standards Association.

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July 6, 1959

Strike Odds Drop, but Nobody Is Canceling

STEEL BUYERS think there's a chance a strike may be averted, but they're not staking their reputations on it.

Despite government pressure for settlement and clear indications that neither side wants a walkout, users are trying to get as much steel as they can before July 15. Instead of issuing hold orders or cancellations, they're telling suppliers to ship tonnage booked for late June or early July as quickly as possible.

EXTENSION TO BOOST SALES?— Postponement on June 27 of the contract termination date to July 15 creates another pressure point, but users won't be so desperate when the new deadline rolls around. Some steelmakers think the extension may stiffen the market a little. Users who had despaired of getting any more tonnage in late June may try to fill out their inventories.

MILLS HOPE TO CATCH UP— Because they had big carryovers on some products at the end of June, steelmakers welcomed the President's suggestion that production and contract talks be continued until a settlement is reached. At Pittsburgh, a leading sheet producer hopes to get all of its back orders out by July 15. Competitors in the East and Midwest are too far behind to catch up (three or four weeks), but they'll try to pacify customers who've been waiting longest. A Chicago steelmaker expects to clean up its June orders for all products except sheets and plates.

In the East, a plate producer says it's no more than a week or ten days behind schedule. A major midwest supplier has no illusions about getting current on shipments from its 96 and 160 in. mills. Four weeks behind schedule, it believes orders will continue to roll in.

AUTOMAKERS JUBILANT— Although they've accumulated 70 to 90 day steel inventories at their own plants, some of the automakers (notably Ford and American Motors) have been worried about suppliers' stocks. Just before the contract extension, a carbuilder discovered that one of its fastener suppliers had only a 20 day inventory of steel. Now, the company will have a chance to do some additional hedging. Automakers regard the extension as a godsend, but they're still going on the assumption that there may be a strike.

IMPACT ON SERVICE CENTERS— From June 15 (when consumers began to fear that they wouldn't get the steel they had ordered from mills) until Friday, June 26, service centers did a land-office business. Sales for the month were 25 to 30 per cent ahead of May's. On Monday, June 29, service center sales dropped to one-third of the preceding Friday's volume because of the contract extension. Business will remain dull for the first half of July as consumers take belated delivery of their June mill tonnage.

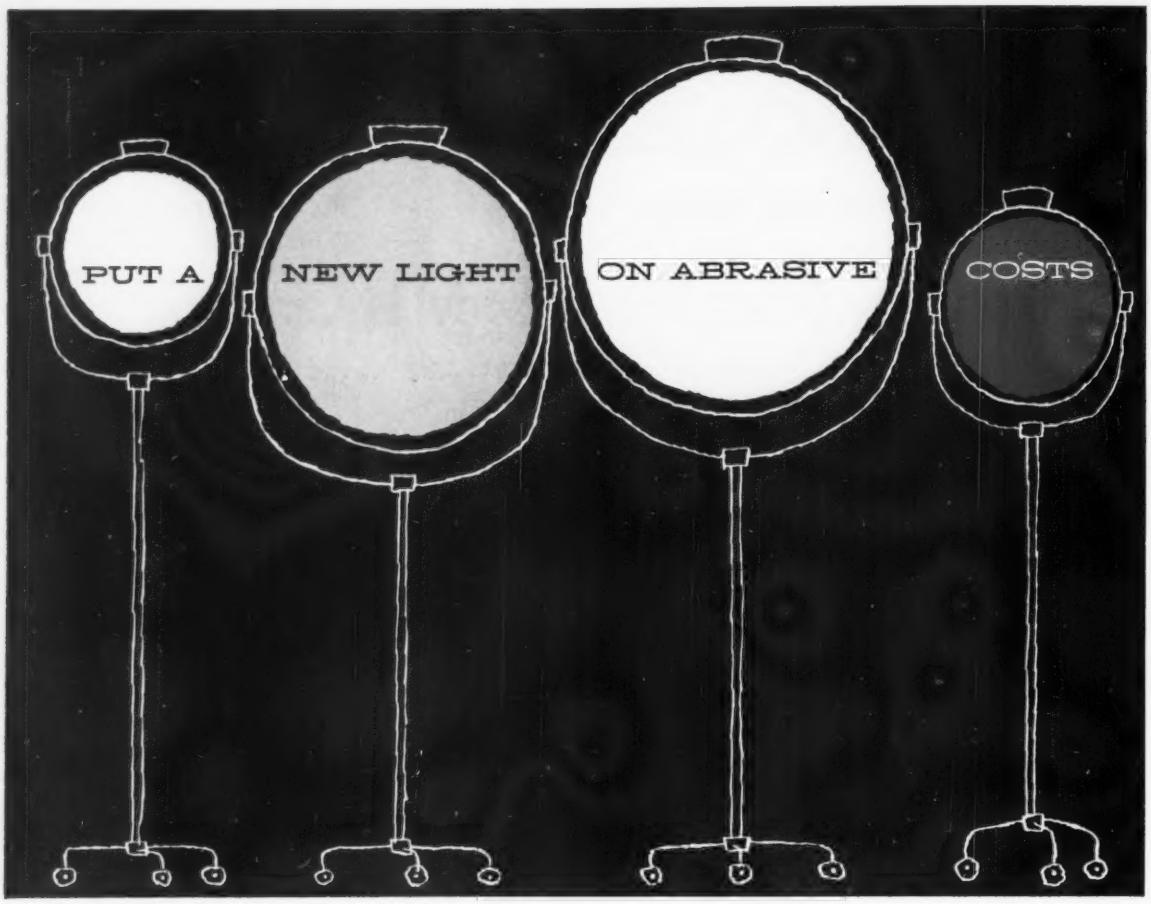
PRODUCTION SKIDS— Last week, steelmaking operations slipped 4 points to 84 per cent of capacity, the lowest rate since the middle of February. Production was about 2,378,000 ingot tons. Two factors contributed to the decline: 1. Operating delays in the wake of wildcat strikes. 2. Reduced output on July 4, a contractual holiday.

WHERE TO FIND MARKETS & PRICES

	News	Prices
Bars, Merchant	112	120
Reinforcing	112	121
Boiler Tubes	...	123
Canada	...	*
Clad Steel	...	124
Coke	117	126
Coal Chemicals	...	126
Charts:		
Finished Steel	...	119
Ingot Rate	118	...
Scrap Prices	...	131
Comparisons	...	119
Contracts Placed	129	...
Contracts Pend.	129	...
Electrodes	...	126
Fasteners	...	123
Ferroalloys	117	128
Fluorspar	...	126
Footnotes	...	123
Imported Steel	115	126
Ingot Rates	118	...
Ingot Output	114	...
Metal Powder	...	126
Nonferrous Met.	134	136
Ores	117	126
Pig Iron	116	125
Piling	...	120
Plates	112	120
Plating Material	...	137
Prestressed Strand	...	*
Price Indexes	...	119
Producers' Key	121	...
R.R. Materials	115	123
Refractories	...	126
Scrap	130	132
Semifinished	118	120
Service Centers	116	125
Sheets	113	121
Silicon Steel	...	122
Stainless Steel	...	124
Strip	113	122
Structurals	118	120
Tin Mill Prod.	113	122
Tool Steel	...	124
Tubular Goods	114	124
Wire	114	122

*Current prices were published in the June 29 issue and will appear in subsequent issues.

Metalworking Outlook—Page 31 Technical Outlook—Page 75



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STEEL
QUARTERLY SURVEY

COMPONENTS	CURRENT INVENTORIES: UNDER 10 DAYS	10-30 DAYS	30-60 DAYS	60-90 DAYS	3-6 MONTHS	3rd Quarter FORECAST: LOWER	SAME	HIGHER
CASTINGS . . . . . Die, gray iron, malleable, nonferrous, steel.	4%	21%	43%	26%	6%	21%	60%	19%
OTHER FORMED COMPONENTS . . . . Forgings, stampings, springs, wire shapes.	4%	17%	42%	23%	14%	22%	58%	20%
MACHINED COMPONENTS . . . . . Bearings, couplings, cylinders, gears, screw machine products.	5%	18%	36%	28%	13%	18%	58%	24%
ELECTRICAL EQUIPMENT, MOTORS . .	9%	18%	37%	18%	18%	19%	60%	21%
FASTENERS	3%	29%	40%	20%	8%	11%	72%	17%
MECHANICAL RUBBER GOODS, BELTING	8%	24%	47%	14%	7%	19%	62%	19%

FIGURES are percentages of respondents to STEEL's quarterly survey. COLOR UNDERSCORED figures show how most respondents reported.

Part Stocks O.K., Big Strike or No

More than 75 per cent of inventories will last more than four weeks. Good business in the last quarter is expected to force buyers to keep at a high level

COMPONENTS BUYERS are ready for a steel strike if it comes. Respondents to STEEL's quarterly survey report these inventories: Less than ten days, 5 per cent; 10 to 30 days, 20 per cent; four to eight weeks, 41 per cent; eight to twelve weeks, 23 per cent; three to six months, 11 per cent.

Business is good now, and many purchasing agents expect a renewed surge in the fourth quarter to work off any surplus which might develop if there is no strike. About 21 per cent foresee higher stocks by the end of September. That's only a 5 per cent drop from three months previous when stockpiling was clipping along at a hectic pace. Eighteen per cent of the respondents predict lower inventories at the end of the third quarter vs. 10 per cent in the second quarterly survey. The situation can be attributed to an adjustment in the inventory-production ratio. Purchasers of castings and other formed components were the only respondents expecting lower inventories in September.

• **Current Inventories** — Nearly 26 per cent said they are higher than at the end of last quarter. About 17 per cent said they are lower. The trend was down for formed components, fasteners, and mechanical rubber goods and belting. An upturn was indicated for castings, machined components, and electrical equipment and motors.

Inventories rose in the two extreme time periods: Under ten days, the increase was across the board. Except for fasteners, stocks at levels of more than three months either increased or stayed the same. A decline in all levels of the 30 to 60 day category was reported. The 10 to 30 day and 60 to 90 day categories showed a mixed pattern.

• **Slow Deliveries** — Deliveries are more of a problem than they were in the previous survey. More than 41 per cent of STEEL's respondents had difficulties. That's an 11 per cent increase. Supplier's deliveries were said to be inadequate by 8 per cent, a 6 per cent rise over the March figures. Bearings were again pinpointed as causing the most problems. Castings and electrical equipment rounded out the top three trouble spots. Steel mill products, screw machines, and rubber goods were frequently mentioned.

Overstocks were reported by 11 per cent of the respondents. Castings and electric motors were mentioned most often.

Plates . . .

Plate Prices, Page 120

Extension of steel wage contract negotiations until July 15 gives platemakers a chance to narrow the gap between delivery promises and actual shipment dates. While the two weeks' reprieve seems to have taken some of the pressure off the mills, there have been no requests for shipment deferments.

Producers have no illusions about getting current on shipments. One maker with 96 in. and 160 in. mills in the Chicago district is about four weeks behind schedule, for example.

Uncertainties in the labor situation are such that orders are bound to continue rolling in, preventing the mills from getting current. Sales executives don't expect any cancellations so long as the strike threat persists. Generally, arrearages at the end of June averaged about two weeks.

Entries on plate order books for July are as good as those a month ago, and producers expect to operate at fairly high levels during the month. Unless there's a strike, mill operations in the new quarter should average at least 65 per cent, or better, it's said. Sizable orders have been placed for August shipment, but September entries are spotty.

Some new plate fabricating projects are developing in the Pacific Northwest, principally military installations.

Steel Bars . . .

Bar Prices, Page 120

Producers of commercial steel bars don't think the extension of the steel wage talks until July 15 will bring them any more July delivery business. However, it will give them a chance to clean up some of the carryover from June. In general, barmakers are only seven to ten days behind on shipments—two to three weeks on some specialties.

Order books are pretty well loaded for July, and while considerable buying in past months has been of a strike hedge nature, the labor situation hasn't been sufficiently clarified to warrant the cancellation of tonnage on order books.

June carryovers along with firm July entries should assure high level production schedules this month, barring a strike. Consumers can be expected to keep the pressure on producers for shipments until July 15 at least, even though trade opinion leans to the view that the chances for a strike are now less threatening.

Ordering for August is sluggish, but producers anticipate a good pickup in September, when the autobuilders are scheduled to start production of their 1960 models.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 121

Demand for reinforcing steel has been strong over the last several months, reflecting the upsurge in building and construction starting last spring.

Some mills report their shipments have been unusually heavy, bar fabricators evidently seeking to get in as much tonnage as possible before the steel strike deadline. Now that steel wage negotiations have been extended until July 15, the

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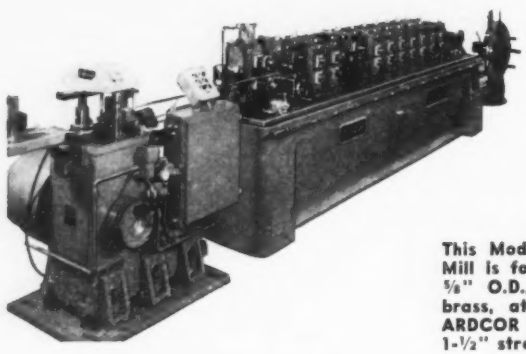
NEW LOCK SEAM TUBE MILL

Maximum Capacity Up To 1" O.D.



This Model SF Lock Seam Tube Mill is forming TV table legs of ⅝" O.D., .016" wall simulated brass, at 120 f.p.m. Cutoff is ARDCOR Model 10 Press with 1-½" stroke, 60 strokes per min.

The new small Model SF ARDCOR Machine features: High production speeds; roll space 5.5"; spindles 1.5"; new style rugged base with tool compartment and slanted front recessed for better operator stance; special narrow side roll stands with close 10" horizontal centers; fixed spur gears; quiet running all V-belt drive; compact 3-roll straightener; low voltage protection. Basic machine readily converted to a Cold Roll Forming Machine.

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mills will have a little more time in which to fill orders.

Pacific Northwest sellers report contractors are pressing for quick deliveries. Several major jobs involving reinforcing bars are pending in the district, including some highway construction and other public work.

Oregon Steel Mills, Portland, Oreg., will not be immediately affected in event of a steel strike at mid-July. Its labor contract extends to Aug. 1.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 121 & 122

With the steel strike deadline postponed to July 15, consumers of cold rolled and galvanized sheets continue to press the mills for nearby shipment tonnage. They still think a strike is possible. The situation is noticeably less tense than a week ago and some feel the chances for an amicable agreement are greater.

In any case, the mills are about three weeks behind on shipment promises, so the extension of the strike deadline for a couple of weeks will permit some of them to become nearly current on deliveries. For example, Inland Steel figures it will be able to clean up its June carryover except for plates, galvanized sheets, and hot rolled sheets which are three to four weeks behind promises.

There is noticeably less consumer pressure for hot rolled sheets than for cold rolled, galvanized, and a few specialties. In a few instances in the East, requests have been received for temporary deferments of shipments, but none are of particular significance.

Some sales executives at Pittsburgh think the extension of the wage bargaining period may stiffen the market a little. They point out that users who had despaired of getting any more sheets before the original June 30 strike deadline, now may try to fill out their inventories before another crisis develops.

Sheetmen would not be surprised if they received a few "hold" orders as a result of the extension, but, as one Pittsburgh seller put it, "Nobody in his right mind would cancel before all of the uncertainties have been removed from the labor picture."

Even if a strike is averted, sheet production will be close to capacity for the remainder of this month. August volume is shaping up pretty well, but September bookings continue spotty.

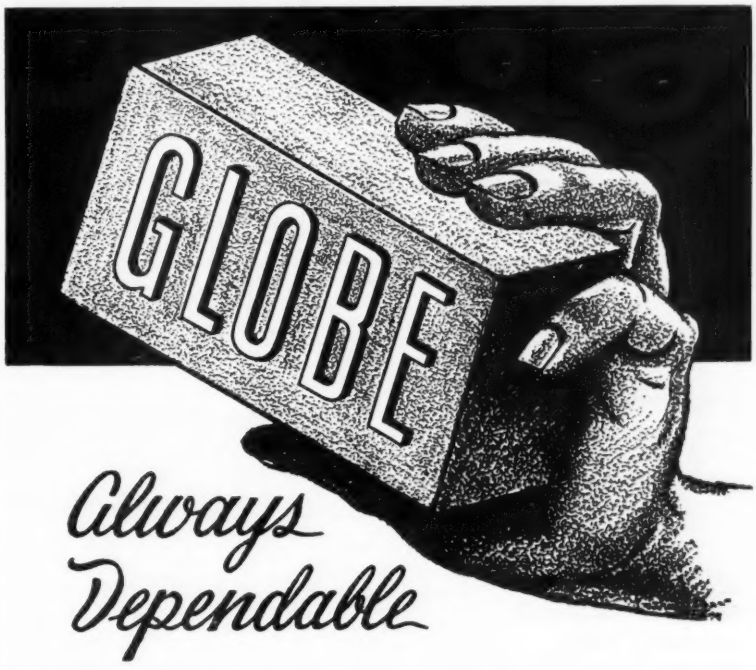
Tin Plate . . .

Tin Plate Prices, Page 122

Metal can shipments increased sharply in April, totaling 389,445 tons vs. 340,861 in March, and 320,902 in April a year ago, reports the U. S. Bureau of the Census. Shipments in the first four months were 1,347,929 tons vs. 1,305,001 in the like 1958 period.

The April movement of fruit and vegetable cans was 93,743 tons vs. 74,655 in March and 73,846 in April last year. The total for the first four months, however, lagged behind the same period last year, amounting to 311,138 tons vs. 340,697.

Shipments of beer cans (the second largest category) amounted to 77,048 tons in April, against 67,376 in March and 61,213 in April, 1958. The total for the first four



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EAST LIVERPOOL, OHIO

months was 242,720 tons vs. 223,088 in the like period last year.

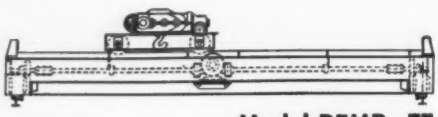
Wire . . .

Wire Prices, Pages 122 & 123

Wiremakers have been booking fair order volume for third quarter delivery, but shipments in the period will probably be down from those in the second quarter, even if a steel strike is averted. Normally, July production schedules are curtailed by vacation suspensions and delays commonly experienced during the summer.

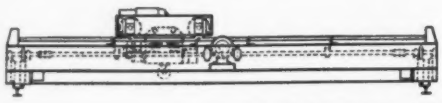
Extension of formal steel wage contract talks gives the mills a little more time to complete orders carried over from June. However, the carryover tonnage was not large. Automotive requirements have been fairly heavy in recent weeks, and it's said that consumers' stocks are ample. Also, the fact that many wiremakers will not be immediately affected by a steel strike serves to eliminate the shipment urgency that might otherwise be in evidence.

STANDARD HEADROOM
Provides highest hook height with top-running trolley and foot mounted hoisting unit.



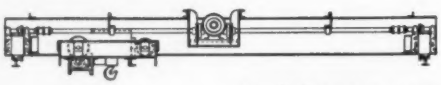
Model DTMD—TT

MEDIUM HEADROOM
Here the hoisting unit is rigidly suspended from the top-running trolley to reduce clearance over rail.



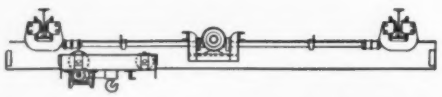
Model DTMD—LT

LOW HEADROOM
Under-running trolley permits unusually high hook lift. Use it where clearance under bridge must be maximum.



Model DTMD—UT

SUSPENDED TRACK
Operates on lower flange of crane runway suspended from roof guiders or other overhead support. Use also where load transfer is desired.



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ABELL-HOWE COMPANY 7747 Van Buren Street • Forest Park, Illinois

May Steel Production Largest for Any Month

Setting a monthly record at 11,600,581 net tons, May production of ingots and steel for castings consisted of 10,106,064 tons of open hearth ingots and 11,904 tons of steel for castings, 200,887 tons of bessemer ingots, 257,160 tons of basic oxygen process steel, 1,018,200 tons of electric furnace ingots, and 6201 tons of electric furnace steel for castings.

Of the total, 10,526,935 tons were carbon steel, 931,426 alloy steel other than stainless, and 142,220 tons stainless and heat resisting steel.

The breakdown of May production by states:

Steel Production—May, 1959
(Net Tons)

States:	May	Year To Date
New York	624,756	2,822,513
Pennsylvania	3,002,005	13,614,990
Rhode Island, New Jersey, Delaware, Maryland, Connecticut	792,510	3,670,444
Virginia, W. Virginia, Georgia, Florida	307,400	1,419,381
Kentucky	141,792	700,472
Alabama, Tennessee, Mississippi	439,903	1,936,707
Ohio	2,140,159	9,802,650
Indiana	1,486,285	7,082,767
Illinois	925,081	4,291,526
Michigan	649,626	3,109,874
Minnesota, Missouri, Oklahoma, Texas	339,901	1,607,355
Arizona, Colorado, Utah, Washington, Oregon	386,765	1,812,282
California	364,398	1,499,608
Total	11,600,581	53,370,569

Data from American Iron & Steel Institute.

Tubular Goods . . .

Tubular Goods Prices, Page 124

Consumers are expected to press the mills for all the tonnage they can ship this month. Extension of the strike deadline to July 15 will permit some users to lay in a little additional tonnage. Generally, it's said users' stocks are in good shape to withstand a strike of several weeks.

Makers of mechanical and pressure tubing anticipate no letdown in demand. Many of these producers would not be affected by a July strike.

Merchant pipe has been moving well in recent weeks, reflecting the activity in construction. It's said buyers protected themselves fairly well against strike induced shortages, but that a prolonged work stoppage would be felt.

August delivery is being offered by makers of pressure tubing.

While demand is stronger than it was a year ago, most producers don't anticipate much change in their market the rest of this year.

Rotary drillers in the U. S. marked up another new high for the week ended June 22, Hughes Tool Co.'s count showing active rigs at 2284. That's 432 above the like week a year ago.

Texas Eastern Transmission Corp. will begin construction soon on a 14 in. diameter lateral line from its Opelousas, La., compressor station to Rayne Field, Acadia Parish, La., a distance of about 22 miles.

Rails, Cars . . .

Track Material Prices, Page 123

Southern Railway System recently placed an order for 48 diesel-electric locomotives with Electro-Motive Div., General Motors Corp., La Grange, Ill. The equipment will cost about $12.7 million. Deliveries of the 2400 hp freight units will start in October.

Foreign Steel Readily Available in Southwest

Counting tonnages held by foreign mill depots and additional stocks put in by speculators, some 50,000 tons of imported steel are available in the Houston area.

Foreign steel continues to undersell the domestic product in the district. At the end of June, buyers had no trouble placing solid orders with overseas producers. Deliveries were being promised within four to five months.

On the average, steel ordered directly from a West European mill costs $28 a ton less than the same kind ordered from a domestic mill. Steel bought from a foreign depot in the area is priced $10 a ton (average) under domestic quotations, and delivery may be had immediately.

The Houston steelmaker's plate mill will be down three to four weeks this month for repairs that have been delayed since February. Barring labor trouble, its July steel rate is likely to average about 50 per cent of capacity. In June the mill shipped close to 90,000 tons, one of the best months in its history.

The other large Texas steelmak-

The trend is to Thomas

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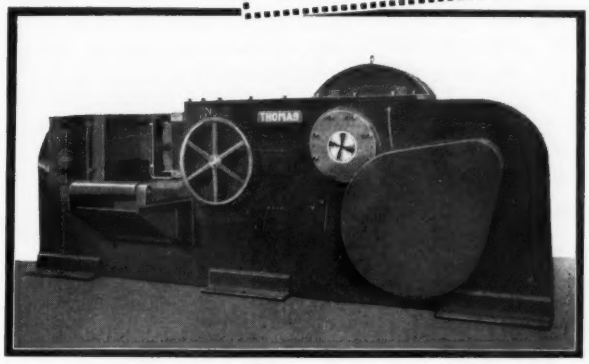

Write for Bulletin 315

The Thomas all-steel Bending and Straightening Machine is built in six sizes, varying from 50 to 400 tons. It does the job quickly and efficiently either *before* or *after* fabricating.

• *Rams are quickly and easily adjustable by means of convenient handwheel so located that operator has unobstructed view of work.*

THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

64

NO WEIGHT LIFTING!

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Why be a weight lifter when Sterlings are available to carry the brunt of the load? The perfectly balanced construction of Sterling Wheelbarrows permits 80% of the load to be carried on the wheel . . . only 20% is carried by the barrow man. And smooth-running, anti-friction bearings make the load seem even lighter. The saving in muscle power increases job efficiency. Crews work faster, make more trips per day. Actually, you'll find Sterlings cost less per year.

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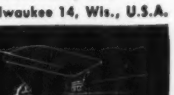

A 8746-1/3R

er, at Lone Star, operated at capacity during June and is expected to maintain that pace this month. It has built up a comfortable inventory of finished pipe.

Distributors . . .

While a steel strike may develop around the middle of this month, distributors doubt if business will be as active as it was in June. Peak bookings were made in that month as consumers rushed to cover requirements over an extended period.

Steel service centers will benefit from the continuance of steelmaking. Since their status on mill books is the same as that of other steel buyers, two more weeks of receipts will result in a welcomed boost in reserve stocks of such products as galvanized sheets, hot and cold rolled sheets, plates, and wide flange beams. Supplies of these items have been tight in most districts.

Prices published by steel service centers in the Southwest are firmer than at any time this year. However, heavy stocks of imported steel, accumulated in the Houston area by speculators banking on a prolonged steel strike, are still a factor that must be considered by sellers of domestic products.

Pig Iron . . .

Pig Iron Prices, Page 125

Demand for merchant iron has dropped sharply as a result of mass vacations at consuming shops and hot weather. July probably will be the slowest month this year with a slight improvement expected in August. June was the most active month so far this year.

Some pig iron producers had started to bank their furnaces before the original strike deadline was changed to July 15, but little tonnage was lost, production being returned to normal quickly.

Mystic Iron Works, a subsidiary of Eastern Gas & Fuel Associates, will maintain prices unchanged in July, August, and September. Prices are on the basis of $68 a gross ton, f.o.b. cars, at Everett, Mass., for foundry pig iron. Differentials for silicon, phosphorus, and manganese are added.

Inland Steel Co. has set back the relining of its No. 5 blast furnace at its Indiana Harbor Works, East Chicago, Ind. The job has been postponed 60 days until early September; originally it was scheduled to start the last week in June. The delay is to allow patching of the brickwork of three stoves of "B" furnace. The lining in No. 5 still is in good shape and the stack's hot metal is needed for July steelmaking operations.

U. S. Steel Corp. has blown out No. 1 blast furnace at its Youngstown District Works for relining.

Columbia-Geneva Steel Div., United States Steel Corp., will reline and overhaul the No. 2 blast furnace at its Geneva (Utah) Works this fall. Ironmaking capacity will be boosted from 1300 tons to over 1500 tons a day. Since the furnace was last relined in 1955, it will have produced close to 1.8 million tons of iron for Geneva's open hearth furnaces.

The furnace will be "jacked up" an additional 12 ft 6 in. to a fin-

Steel Service Centers throughout the country have built up their inventories in anticipation of a suspension in steel production. These stockpiles totaling almost 3,600,000 tons are valued at ¾ billion dollars. If you have been using a steel service center as your source of supply—you can thank your lucky stars—because chances are they will still be able to fill your requirements.

Each distributor's representative is a metal specialist and is qualified to assist you with application and supply problems.

MICROROLD STAINLESS STEEL is regularly carried in stock in 252 of these independent steel warehouses. Washington Steel is a producer of sheet and strip exclusively, all of which is precision rolled on Sendzimir mills.

WASHINGTON STEEL CORPORATION

7-O Woodland Avenue, Washington, Pa.

ished height of about 230 ft, while 18 in. will be added to the diameter of the hearth to 26 ft 6 in.

The three big stoves serving the No. 2 furnace will be increased 40 ft to an over-all height of 169 ft above ground level, says L. B. Worthington, president of the division. Steel production at Geneva will not be affected during the four months, starting in August, that the furnace is not in operation.

Iron Ore . . .

Iron Ore Prices, Page 126

Stocks of iron ore on lower lake docks and in furnace yards at the end of May totaled 42,648,822 gross tons, reports the American Iron Ore Association. That compares with 49,495,586 tons on hand at the end of May a year ago.

Stocks break down this way: U. S. Lake Superior ore, 25,006,571 tons; other U. S. ore, 3,292,661; Canadian Lake Superior ore, 738,770; other Canadian ore, 4,327,400; other foreign ore, 9,342,730.

Consumption during May totaled 12,423,008 tons vs. 6,655,020 tons in the like 1958 month. Consumption this year to the end of May was 57,109,688 tons vs. 35,260,252 in the like period last year.

Active blast furnaces at the end of May totaled 239 compared with 160 a year ago.

A 100,000 ton shortage in Canadian iron ore stocks is expected by Dominion Foundries & Steel Ltd., reports D. A. Lindsay, purchasing agent for the company. He says the shortage is anticipated even in the face of a threatened steel strike in the U. S.

Welland Canal traffic delays have slowed up shipments. It takes 28 hours for a carrier to make the trip (vs. only 12 hours before).

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 126

Production of coke in April totaled 6,074,002 net tons, reports the U. S. Bureau of Mines. It compares with 6,262,234 tons in March, and 3,802,015 tons in April, 1958. Of the total, 152,765 tons were beehive coke, and 6,226,767 tons were oven.

Output in the calendar year to the end of April was 23,305,608 tons (464,671 beehive and 23,770,279 oven) vs. 16,859,578 tons (159,587 beehive and 17,019,165 oven) in the like period of last year.

Producers' stocks of oven coke at the end of April were 3,422,876 tons, equal to 16.9 days' production. At the end of April a year ago the total was 3,721,329 tons, equal to 29.4 days' output.

Oven coke breeze output was 403,861 tons compared with 396,784 tons in March and 256,205 tons in April last year. The total in the first four months this year was 1,533,819 tons vs. 1,116,273 in the first four months of 1958.

Ferroalloys . . .

Ferroalloy Prices, Page 128

Keokuk Electro-Metals Co., Keokuk, Iowa, a division of Vanadium Corp. of America, last week set up a Keokuk basing point for shipments of 50 per cent ferrosilicon, effective July 1.

The company said it is continuing to meet delivered prices from other basing points now in effect, and that no change in the current published f.o.b. prices of 50 per cent ferrosilicon is contemplated.

Crucible Electrifies Mill

Crucible Steel Co. of America, Pittsburgh, will spend $4.5 million during the next six months for the electrification of the blooming mill at its Midland, Pa., Works. Installation of two 5000 hp electric motors will replace steam engines for driving the blooming mill rolls. This expenditure is in addition to the $23 million program for expansion and improvement of the Midland hot strip mill (STEEL, May 18, p. 87).

National Lets Contracts

National Steel Corp., Pittsburgh, has awarded contracts for electrical equipment of the 80 in., continuous, hot strip mill; for an additional oxygen plant; and for an administrative and engineering office building. The projects are part of a $300 million expansion program.

The 80 in. mill will be installed at Great Lakes Steel Corp., Detroit, and will have a rated capacity of 3.6 million tons of steel coils a year. Contract for the mill's fin-

.0005 to .125

in the 200, 300, and 400 series of Stainless Steel Strip plus Inconel, Inconel "X", A286, L605, 17-7 P.H. and many other super alloys in stock — supplied in two weeks or made to order in three weeks.

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ishing stand electrical equipment was awarded to General Electric Co.; that for electrical equipment on the remainder of the mill and auxiliary facilities, to Westinghouse Electric Corp.

Air Products Co. was awarded the contract to construct an oxygen plant at Weirton Steel Co. It will have a capacity of 650 tons a day.

The office building will be erected in Portage, Ind., for Midwest Steel Corp. which will build a plant at that location for production of sheets and strip, galvanized steel, and tin plate.

Semifinished Steel . . .

Semifinished Prices, Page 120

Extension of steel wage negotiations until July 15 came too late to prevent the curtailing of steelmaking operations so that last week's ingot rate was off almost 3.8 points to 84 per cent of capacity from the preceding week's revised rate.

Output of steel in the week was estimated at 2,378,000 net tons, smallest since mid-February. Most of the production loss was occasioned by wildcat strikes.

Operations are expected to recover during the next couple weeks, barring similar trouble. However, the vacation season will probably hold back production to some extent, even though a strike is averted.

Numerous blast furnaces had been scheduled for banking, but this hadn't got far when labor negotiations were extended. Little time was lost in resuming full production at most stacks.

Structural Shapes . . .

Structural Shape Prices, Page 120

While structural fabricating shops have good sized backlogs, new awards continue light. Fabricators see no prospects of immediate improvement.

The sharp break came in May. The American Institute of Steel Construction reports bookings declined to 241,612 tons from 294,806 in April. Bookings for the first five months of the year totaled 1,321,342 tons, up 36 per cent from the 976,243 tons placed in the corresponding 1958 period.

May shipments, reports the institute, increased for the third

(*Please turn to Page* 129)

Steel Shipments to Market Classifications—April, 1959

(Net tons)

MARKETS:	April, 1959	April, 1958	Four Month Totals 1959	1958
Converting, processing	361,715	215,844	1,208,851	884,789
Forgings (except auto)	112,079	54,413	383,182	233 478
Fasteners	145,758	51,760	492,807	237,053
Warehouses:				
Oil & Gas	248,927	58,294	785,304	303,772
All other	1,347,181	749,506	4,551,926	2,758,172
Total Warehouse	1,596,108	807,800	5,337,230	3,061,944
Construction:				
Rail transportation	5,695	3,446	20,897	16,467
Oil & Gas	350,739	150,944	970,193	597,106
All other	800,646	499,172	2,658,151	2,002,939
Total Construction	1,157,080	653,562	3,649,241	2,616,512
Contractors' Products	442,317	266,973	1,526,399	1,015,397
Automotive:				
Cars, trucks, parts	1,675,517	448,223	6,253,075	2,724,703
Forgings	53,019	14,441	190,031	76,472
Total Automotive	1,728,536	462,664	6,443,106	2,801,175
Rail Transportation:				
Rails, track, equipment	111,498	64,538	408,796	245,345
Cars & locomotives	209,594	62,095	653,115	350,158
Streetcars, etc.	3 316	2,375	9,635	6,890
Total Railroad	324,408	129,008	1,071,546	602,393
Shipbuilding	78,838	74,148	305,266	309,596
Aircraft	8,433	4,455	25 410	19,480
Oil & gas drilling	78,956	23,961	238,103	115,286
Mining, quarrying, lumbering	25,854	17,835	91,459	60,994
Agricultural:				
Machinery	121,148	69,524	435,523	296,183
All other	39,469	20,590	124,511	66,098
Total Agricultural	160,617	90,114	560,034	362,281
Machinery, tools, etc.	510,020	230,954	1,792,062	1,012,753
Elec. machinery	249,623	140,765	885,630	565,583
Appliances, etc.	223,006	111,919	807,095	466,320
Other equipment	220,396	128,065	797,734	516,581
Containers:				
Cans and closures	707,192	490,416	2,197,016	1,838,558
Barrels, drums, pails	99,276	65,540	330 110	234,084
All other	64,564	34,657	234,034	143,943
Total Containers	871,032	590,613	2,761,160	2,216,585
Ordnance, other military	17,560	22,127	56,861	75,709
Nonclassified	101,465	54,489	340,085	208,501
Total Domestic Shipments	8,413,801	4,131,469	28,773,261	17,382,410
Exports	188,725	241,502	677,189	937,137
Total Shipments	8,602,526	4,372,971	29,450,450	18,319,547

Data from American Iron & Steel Institute.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

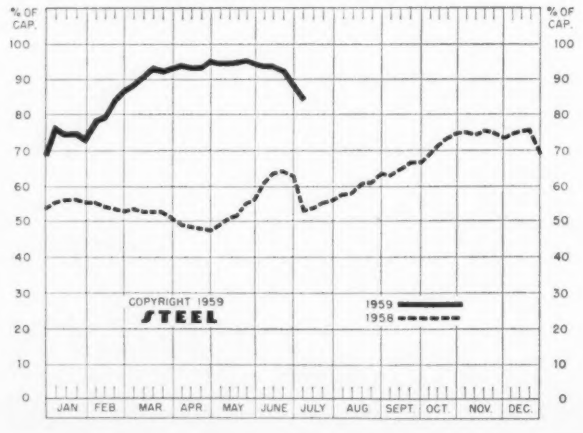
	Week Ended July 5	Change	Same Week 1958	1957
Pittsburgh	81.5	— 1.5*	50	83
Chicago	91	— 3.5	61	86
Eastern	92	— 1	56	89
Youngstown	90	— 2	25	68.5
Wheeling	84	— 6	68.5	72
Cleveland	71.5	—19.5*	25	80.5
Buffalo	107	— 0.5	41.5	85.5
Birmingham	92	0	66.5	92.5
Cincinnati	88	— 3.5*	65	77.5
St. Louis	97.5	+ 0.5*	85	80.5
Detroit	91.5	— 3.5*	52.5	112
Western	91	— 3.5	70	100
National Rate	84	— 3.8*	53	78.5

INGOT PRODUCTION

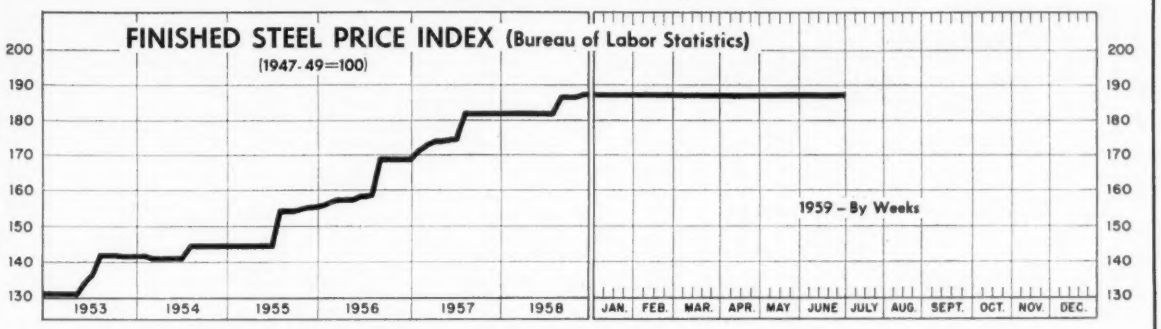
	Week Ended July 5	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	148.0†	154.8	165.2	85.7
NET TONS (In thousands)	2,378†	2,486	2,653	1,376

*Change from preceding week's revised rate.
†Estimated by STEEL; comparative figures reported by AISI.
Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



June 30, 1959	Week Ago	Month Ago	May Avg.	Year Ago
186.7	186.7	186.7	186.7	181.5

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended June 30

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon	10.710
Tie Plates	6.875	Bars, C.F., Alloy	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.570
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon	6.350
Plates, Carbon	6.350	Sheets, C.R., Carbon	7.300
Structural Shapes	6.167	Sheets, Galvanized	8.615
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.658
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical	12.625
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon	9.489
Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.480
Bars, H.R., Alloy	10.775	Strip, H.R., Carbon	6.250
Bars, H.R., Stainless, 303 (lb)	0.543	Pipe, Black, Buttweld (100 ft)	19.905
Bars, H.R., Carbon	6.675	Pipe, Galv., Buttweld (100 ft)	23.253
		Pipe, Line (100 ft)	199.533
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
		Tubes, Boiler (100 ft)	51.200
		Tubing, Mechanical, Carbon (100 ft)	27.005
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
		Black Plate, Canmaking Quality (95 lb base box)	7.900
		Wire, Drawn, Carbon	10.575
		Wire, Drawn, Stainless, 430 (lb)	0.665
		Bale Ties (bundles)	7.967
		Nails, Wire, 8d Common	9.825
		Wire, Barbed (80-rod spool)	8.722
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	July 1 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	239.15	189.75
Index in cents per lb	6.713	6.713	6.713	6.479	5.140

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$145.52	$113.20
No. 2 Fdry, Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap GT	36.83	36.50	35.00	35.67	27.83

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	July 1 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.15
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.15
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.725	4.405
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.20
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.10
Shapes Std., Chicago	5.50	5.50	5.50	5.275	4.10
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.38
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.10
Plates, Chicago	5.30	5.30	5.30	5.10	4.10
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.10
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.10
Plates, Claymont, Del.	5.30	5.30	5.30	5.10	4.10
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.925
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.775
Sheets, C.R. Chicago	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05	4.975
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.275
Strip, H.R., Pittsburgh	5.10	5.10	5.10	4.925	4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.15	5.45
Strip, C.R., Chicago	7.425	7.425	7.425	7.15	5.70
Strip, C.R., Detroit	7.425	7.425	7.425	7.15	5.65
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.55
Tin plate(1.50 lb)box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$75.50
Wire rods $\frac{7}{32}$-$\frac{7}{16}$" Pitts.	6.40	6.40	6.40	6.15	4.525

PIG IRON, Gross Ton	July 1 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pittsburgh	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Philadelphia	70.41	70.41	70.41	70.41	59.66
No. 2 Fdry, NevilleIsland,Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	60.16
No. 2 Fdry, Birmingham	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry(Birm.)deld., Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt Pittsburgh	$36.50	$36.50	$34.50	$35.50	$29.50
No. 1 Heavy Melt E. Pa.	38.00	38.00	36.00	34.00	23.00
No. 1 Heavy Melt, Chicago	36.00	35.00	34.50	37.50	31.00
No. 1 Heavy Melt, Valley	41.50	39.50	39.50	36.50	27.50
No. 1 Heavy Melt, Cleve.	38.50	36.50	36.50	33.00	26.50
No. 1 Heavy Melt, Buffalo	33.50	33.50	33.50	26.50	26.50
Rails, Rerolling, Chicago	59.50	59.50	58.50	55.50	42.56
No. 1 Cast, Chicago	52.50	52.50	49.50	41.50	36.00

COKE, Net Ton					
Beehive, Furn., Connisvl.	$15.00	$15.00	$15.00	$15.25	$14.75
Beehive, Fdry., Connisvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	30.50	25.25

Steel Prices

Mill prices as reported to STEEL, July 1, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 121; footnotes, page 123.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 ....$76.00

INGOTS, Alloy (NT)

Detroit 841 ....$82.00
Economy,Pa. B14 ....82.00
Farrell,Pa. S3 ....82.00
Lowellville,O. S3 ....82.00
Midland,Pa. C18 ....82.00
Munhall,Pa. U5 ....82.00
Sharon,Pa. S3 ....82.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)

Bartonville,Ill. K4 ....$82.00
Bessemer,Pa. U5 ....80.00
Buffalo R2 ....80.00
Clairton,Pa. U5 ....80.00
Ensley,Ala. T2 ....80.00
Fairfield,Ala. T2 ....80.00
Fontana,Calif. K1 ....90.50
Gary,Ind. U5 ....80.00
Johnstown,Pa. B2 ....80.00
Lackawanna,N.Y. B2 ..80.00
Munhall,Pa. U5 ....80.00
Owensboro,Ky G8 ....80.00
S.Chicago,Ill. R2, U5 ..80.00
S.Duquesne,Pa. U5 ....80.00
Sterling,Ill. N15 ....80.00
Youngstown R2 ....80.00

Carbon, Forging (NT)

Bessemer,Pa. U5 ....$99.50
Buffalo R2 ....99.50
Canton,O. R2 ....102.00
Clairton,Pa. U5 ....99.50
Conshohocken,Pa. A3..104.50
Ensley,Ala. T2 ....99.50
Fairfield,Ala. T2 ....99.50
Farrell,Pa. S3 ....99.50
Fontana,Calif. K1 ....109.00
Gary,Ind. U5 ....99.50
Geneva,Utah C11 ....99.50
Houston S5 ....104.50
Johnstown,Pa. B2 ....99.50
Lackawanna,N.Y. B2..99.50
LosAngeles B3 ....109.00
Midland,Pa. C18 ....99.50
Munhall,Pa. U5 ....99.50
Owensboro,Ky. G8 ....99.50
Seattle B3 ....109.00
Sharon,Pa. S3 ....99.50
S.Chicago R2, U5, W14..99.50
S.Duquesne,Pa. U5 ....99.50
S.SanFrancisco B3 ....109.00
Warren,O. C17 ....99.50

Alloy, Forging (NT)

Bethlehem,Pa. B2 ..$119.00
Bridgeport,Conn. C32..119.00
Buffalo R2 ....119.00
Canton,O. R2, T7 ....119.00
Conshohocken,Pa. A3..126.00
Detroit 841 ....119.00
Economy,Pa. B14 ....119.00
Farrell,Pa. S3 ....119.00
Fontana,Calif. K1 ....140.00
Gary,Ind. U5 ....119.00
Houston S5 ....124.00
Ind.Harbor,Ind. Y1 ..119.00
Johnstown,Pa. B2 ....119.00
Lackawanna,N.Y. B2..119.00
LosAngeles B3 ....139.00
Lowellville,O. S3 ....119.00
Massillon,O. R2 ....119.00
Midland,Pa. C18 ....119.00
Munhall,Pa. U5 ....119.00
Owensboro,Ky. G8 ....119.00
Sharon,Pa. S3 ....119.00
S.Chicago R2,U5,W14..119.00
S.Duquesne,Pa. U5 ..119.00
Struthers,O. Y1 ....119.00
Warren,O. C17 ....119.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 ....$122.50
Canton,O. R2 ....125.00
Cleveland R2 ....122.50
Gary,Ind. U5 ....122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 ..122.50
Warren,O. C17 ....122.50

SKELP

Aliquippa,Pa. J5 ....5.05
Munhall,Pa. U5 ....5.05
Pittsburgh J5 ....5.05
Warren,O. R2 ....5.05
Youngstown R2, U5 ....5.05

WIRE RODS

AlabamaCity,Ala. R2 ..6.40
Aliquippa,Pa. J5 ....6.40
Alton,Ill. L1 ....6.60
Bartonville,Ill. K4 ....6.50
Buffalo W12 ....6.40
Cleveland A7 ....6.40
Donora,Pa. A7 ....6.40
Fairfield,Ala. T2 ....6.40
Houston S5 ....6.65
IndianaHarbor,Ind. Y1..6.40
Johnstown,Pa. B2 ....6.40
Joliet,Ill. A7 ....6.40
KansasCity,Mo. S5 ....6.65
Kokomo,Ind. C16 ....6.50
LosAngeles B3 ....7.20
Minnequa,Colo. C10 ....6.65
Monessen,Pa. P7 ....6.40
N.Tonawanda,N.Y. B11 6.40
Pittsburg,Calif. C11 ....7.20
Portsmouth,O. P12 ....6.40
Roebling,N.J. R5 ....6.50
S.Chicago,Ill. R2, W14 ..6.40
SparrowsPoint,Md. B2 ..6.50
Sterling,Ill.(1) N15 ....6.40
Sterling,Ill N15 ....6.50
Struthers,O. Y1 ....6.40
Worcester,Mass. A7 ....6.70

STRUCTURALS

Carbon Steel Std. Shapes

AlabamaCity,Ala. R2 ..5.50
Aliquippa,Pa. J5 ....5.50
Atlanta A11 ....5.70
Bessemer,Ala. T2 ....5.50
Bethlehem,Pa. B2 ....5.55
Birmingham C15 ....5.50
Clairton,Pa. U5 ....5.50
Fairfield,Ala. T2 ....5.50
Fontana,Calif. K1 ....6.30
Gary,Ind. U5 ....5.50
Geneva,Utah C11 ....5.50
Houston S5 ....5.60
Ind.Harbor,Ind. I-2, Y1..5.50
Johnstown,Pa. B2 ....5.55
Joliet,Ill. P22 ....5.50
KansasCity,Mo. S5 ....5.60
Lackawanna,N.Y. B2 ..5.55
LosAngeles B3 ....6.20
Minnequa,Colo. C10 ....5.80
Munhall,Pa. U5 ....5.50
Niles,Calif. P1 ....6.25
Phoenixville,Pa. P4 ....5.55
Portland,Oreg. O4 ....6.25
Seattle B3 ....6.25
S.Chicago,Ill. U5, W14..5.50
S.SanFrancisco B3 ....6.15
Sterling,Ill. N15 ....5.50
Torrance,Calif. C11 ....6.20
Weirton,W.Va. W6 ....5.50

Wide Flange

Bethlehem,Pa. B2 ....5.55
Clairton,Pa. U5 ....5.50
Fontana,Calif. K1 ....6.45
IndianaHarbor,Ind. I-2..5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 ....5.50
Phoenixville,Pa. P4 ....5.55
S.Chicago,Ill. U5 ....5.50
Sterling,Ill. N15 ....5.50
Weirton,W.Va. W6 ....5.50

Alloy Std. Shapes

Aliquippa,Pa. J5 ....6.80
Clairton,Pa. U5 ....6.80
Gary,Ind. U5 ....6.80
Houston S5 ....6.90
Munhall,Pa. U5 ....6.80
S.Chicago,Ill. U5, W14..6.80

H.S., L.A., Std. Shapes

Aliquippa,Pa. J5 ....8.05
Bessemer,Ala. T2 ....8.05
Bethlehem,Pa. B2 ....8.10
Clairton,Pa. U5 ....8.05
Fairfield,Ala. T2 ....8.05
Fontana,Calif. K1 ....8.85
Gary,Ind. U5 ....8.05
Geneva,Utah C11 ....8.05
Houston S5 ....8.15
Ind.Harbor,Ind. I-2, Y1..8.05
Johnstown,Pa. B2 ....8.10
KansasCity,Mo. S5 ....8.15
Lackawanna,N.Y. B2 ..8.10
LosAngeles B3 ....8.75
Munhall,Pa. U5 ....8.05
Seattle B3 ....8.80
S.Chicago,Ill. U5, W14..8.05
S.SanFrancisco B3 ....8.70
Sterling,Ill. N15 ....7.75
Struthers,O. Y1 ....8.05

H.S., L.A., Wide Flange

Bethlehem,Pa. B2 ....8.10
Ind.Harbor,Ind. I-2 ....8.05
Lackawanna,N.Y. B2 ..8.10
Munhall,Pa. U5 ....8.05
S.Chicago,Ill. U5 ....8.05
Sterling,Ill. N15 ....7.75

PILING

BEARING PILES

Bethlehem,Pa. B2 ....5.55
Ind.Harbor,Ind. I-2 ....5.50
Lackawanna,N.Y. B2 ..5.55
Munhall,Pa. U5 ....5.50
S.Chicago,Ill. I-2, U5 ..5.50

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ....6.50
Lackawanna,N.Y. B2 ..6.50
Munhall,Pa. U5 ....6.50
S.Chicago,Ill. I-2, U5 ..6.50
Weirton,W.Va. W6 ....6.50

PLATES

PLATES, Carbon Steel

AlabamaCity,Ala. R2 ..5.30
Aliquippa,Pa. J5 ....5.30
Ashland,Ky.(15) A10 ..5.30
Atlanta A11 ....5.50
Bessemer,Ala. T2 ....5.30
Clairton,Pa. U5 ....5.30
Claymont,Del. C22 ....5.30
Cleveland J5, R2 ....5.30
Coatesville,Pa. L7 ....5.30
Conshohocken,Pa. A3 ..5.30
Ecorse,Mich. G5 ....5.30
Fairfield,Ala. T2 ....5.30
Farrell,Pa. S3 ....5.30
Fontana,Calif.(30) K1 ..6.10
Gary,Ind. U5 ....5.30
Geneva,Utah C11 ....5.30
GraniteCity,Ill. G4 ....5.40
Harrisburg,Pa. P4 ....5.30
Houston S5 ....5.40
Ind.Harbor,Ind. I-2, Y1..5.30
Johnstown,Pa. B2 ....5.30
Lackawanna,N.Y. B2 ..5.30
Mansfield,O. E6 ....5.30
Minnequa,Colo. C10 ....6.15
Munhall,Pa. U5 ....5.30
Newport,Ky. A2 ....5.30
Pittsburgh J5 ....5.30
Riverdale,Ill. A1 ....5.30
Seattle B3 ....6.20
Sharon,Pa. S3 ....5.30
S.Chicago,Ill. U5, W14..5.30
SparrowsPoint,Md. B2 ..5.30
Sterling,Ill. N15 ....5.30
Steubenville,O. W10 ....5.30
Warren,O. R2 ....5.30
Youngstown U5, Y1 ....5.30
Youngstown (27) R2 ..5.30

PLATES, Carbon Abras. Resist.

Claymont,Del. C22 ....7.05
Fontana,Calif. K1 ....7.85
Geneva,Utah C11 ....7.05
Houston S5 ....7.15
Johnstown,Pa. B2 ....7.05
SparrowsPoint,Md. B2 ..7.05

PLATES, Wrought Iron

Economy,Pa. B14 ....13.55

PLATES, H.S., L.A.

Aliquippa,Pa. J5 ....7.95
Ashland,Ky. A10 ....7.95
Bessemer,Ala. T2 ....7.95
Clairton,Pa. U5 ....7.95
Claymont,Del. C22 ....7.95
Cleveland J5, R2 ....7.95
Coatesville,Pa. L7 ....7.95
Conshohocken,Pa. A3 ..7.95
Economy,Pa. B14 ....7.95
Ecorse,Mich. G5 ....7.95
Fairfield,Ala. T2 ....7.95
Farrell,Pa. S3 ....7.95
Fontana,Calif.(30) K1 ..8.75
Gary,Ind. U5 ....7.95
Geneva,Utah C11 ....7.95
Houston S5 ....8.05
Ind.Harbor,Ind. I-2, Y1..7.95
Johnstown,Pa. B2 ....7.95
Munhall,Pa. U5 ....7.95
Pittsburgh J5 ....7.95
Seattle B3 ....8.85
Sharon,Pa. S3 ....7.95
S.Chicago,Ill. U5, W14..7.95
SparrowsPoint,Md. B2 ..7.95
Warren,O. R2 ....7.95
Youngstown U5, Y1 ....7.95

PLATES, Alloy

Aliquippa,Pa. J5 ....7.50
Claymont,Del. C22 ....7.50
Coatesville,Pa. L7 ....7.50
Economy,Pa. B14 ....7.50
Farrell,Pa. S3 ....7.50
Fontana,Calif. K1 ....8.30
Gary,Ind. U5 ....7.50
Houston S5 ....7.60
Ind.Harbor,Ind. Y1 ....7.50
Johnstown,Pa. B2 ....7.50
Lowellville,O. S3 ....7.50
Munhall,Pa. U5 ....7.50
Newport,Ky. A2 ....7.50
Pittsburgh J5 ....7.50
Seattle B3 ....8.40
Sharon,Pa. S3 ....7.50
S.Chicago,Ill. U5, W14..7.50
SparrowsPoint,Md. B2 ..7.50
Youngstown Y1 ....7.50

FLOOR PLATES

Cleveland J5 ....6.375
Conshohocken,Pa. A3 ..6.375
Ind.Harbor,Ind. I-2 ..6.375
Munhall,Pa. U5 ....6.375
Pittsburgh J5 ....6.375
S.Chicago,Ill. U5 ....6.375

PLATES, Ingot Iron

Ashland c.l.(15) A10 ..5.55
Ashland l.c.l.(15) A10 ..6.05
Cleveland c.l. R2 ....6.05
Warren,O. c.l. R2 ....6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)

Ala.City,Ala.(9) R2 ..5.675
Aliquippa,Pa. (9) J5 ..5.675
Alton,Ill. L1 ....5.875
Atlanta (9) A11 ....5.875
Bessemer,Ala.(9) T2 ..5.675
Birmingham(9) C15 ..5.675
Buffalo(9) R2 ....5.675
Canton,O. (23) R2 ....6.15
Clairton,Pa.(9) U5 ..5.675
Cleveland(9) R2 ....5.675
Ecorse,Mich.(9) G5 ....5.675
Emeryville,Calif. J7 ....6.425
Fairfield,Ala.(9) T2 ..5.675
Fairless,Pa.(9) U5 ....5.825
Fontana,Calif.(9) K1 ..6.375
Gary,Ind.(9) U5 ....5.675
Houston(9) S5 ....5.925
Ind.Harbor(9) I-2, Y1..5.675
Johnstown,Pa.(9) B2 ..5.675
Joliet,Ill. P22 ....5.675
KansasCity,Mo.(9) S5..5.925
Lackawanna(9) B2 ....5.675
LosAngeles(9) B3 ....6.375
Massillon,O. (23) R2 ..6.15
Midland,Pa.(23) C18 ..6.025
Milton,Pa. M18 ....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 ....6.375
N.T'wan'a,N.Y.(23) B11 6.025
Owensboro,Ky.(9) G8 ..6.025
Pittsburg,Calif.(9) C11 6.375
Pittsburgh(9) J5 ....5.675
Portland,Oreg. O4 ....6.425
Riverdale,Ill.(9) A1 ..5.675
Seattle A24, B3, N14 ..6.425
S.Ch'c'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5..5.675
S.SanFran.,Calif.(9)F3 6.425
Sterling,Ill.(1)(9) N15..5.675
Sterling,Ill.(9) N15 ...5.775
Struthers,O.(9) Y1 ...5.675
Tonawanda,N.Y. B12 ..5.675
Torrance,Calif.(9) C11..6.375
Warren,O. C17 ....6.075
Youngstown(9) R2, U5 5.675

BARS, Hot-Rolled Alloy

Aliquippa,Pa. J5 ....6.725
Bethlehem,Pa. B2 ....6.725
Bridgeport,Conn. C32 ..6.80
Buffalo R2 ....6.725
Canton,O. R2, T7 ....6.725
Clairton,Pa. U5 ....6.725
Detroit S41 ....6.725
Economy,Pa. B14 ....6.725
Ecorse,Mich. G5 ....6.725
Fairless,Pa. U5 ....6.875
Farrell,Pa. S3 ....6.725
Fontana,Calif. K1 ....7.775
Gary,Ind. U5 ....6.725
Houston S5 ....6.975
Ind.Harbor,Ind. I-2, Y1..6.725
Johnstown,Pa. B2 ....6.725
KansasCity,Mo. S5 ....6.975
Lackawanna,N.Y. B2 ..6.725
LosAngeles B3 ....7.775
Lowellville,O. S3 ....6.725
Massillon,O. R2 ....6.725
Midland,Pa. C18 ....6.725
Owensboro,Ky. G8 ....6.725
Pittsburgh J5 ....6.725
Sharon,Pa. S3 ....6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 ....6.725
Struthers,O. Y1 ....6.725
Warren,O. C17 ....6.725
Youngstown U5 ....6.725

BARS & SMALL SHAPES, H.R.

High-Strength, Low-Alloy

Aliquippa,Pa. J5 ....8.30
Bessemer,Ala. T2 ....8.30
Bethlehem,Pa. B2 ....8.30
Clairton,Pa. U5 ....8.30
Cleveland R2 ....8.30
Ecorse,Mich. G5 ....8.30
Fairfield,Ala. T2 ....8.30
Fontana,Calif. K1 ....9.00
Gary,Ind. U5 ....8.30
Houston S5 ....8.55
Ind.Harbor,Ind. Y1 ....8.30
Johnstown,Pa. B2 ....8.30
KansasCity,Mo. S5 ....8.55
Lackawanna,N.Y. B2 ..8.30
LosAngeles B3 ....9.00
Pittsburgh J5 ....8.30
Seattle B3 ....9.05
S.Chicago,Ill. R2, W14..8.30
S.Duquesne,Pa. U5 ....8.30
S.SanFrancisco B3 ....9.05
Struthers,O. Y1 ....8.30
Youngstown U5 ....8.30

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa.(9) B2 ..5.825
Houston(9) S5 ....5.925
KansasCity,Mo.(9)S5 ..5.925
Lackawanna(9) B2 ....5.675
Sterling,Ill. N15 ....5.775
Sterling,Ill.(1) N15 ..5.675
Tonawanda,N.Y. B12 ..5.675

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 ....5.675
Atlanta A11 ....5.875
Joliet,Ill. P22 ....5.675
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 ....6.375
Pittsburgh J5 ....5.675
Portland,Oreg. O4 ....6.425
SanFrancisco S7 ....6.52
Seattle B3 ....6.425

BAR SHAPES, Hot-Rolled Alloy

Aliquippa,Pa. J5 ....6.80
Clairton,Pa. U5 ....6.80
Gary,Ind. U5 ....6.80
Houston S5 ....7.05
KansasCity,Mo. S5 ....7.05
Pittsburgh J5 ....6.80
Youngstown U5 ....6.80

BARS, C.F. Loaded (Including loaded extra) Carbon

LosAngeles P2, S30 ..11.75*

Alloy

Ambridge,Pa. W18 ..10.175
BeaverFalls,Pa. M12..10.175
Camden,N.J. P13 ....10.35
Chicago W18 ....10.175
Elyria,O. W8 ....10.175
Monaca,Pa. S17 ....10.175
Newark,N.J. W18 ....10.35
SpringCity,Pa. K3 ....10.35

*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ....7.65
BeaverFalls,Pa. M12,R2 7.65
Birmingham C15 ....8.25
Buffalo B5 ....7.70
Camden,N.J. P13 ....8.10
Carnegie,Pa. C12 ....7.65
Chicago W18 ....7.65
Cleveland A7, C20 ....7.65
Detroit B5, P17 ....7.85
Detroit S11 ....7.65
Donora,Pa. A7 ....7.65
Elyria,O W8 ....7.65
FranklinPark,Ill. N5 ....7.65
Gary,Ind. R2 ....7.65
GreenBay,Wis. F7 ....7.65
Hammond,Ind. J5, L2 ..7.65
Hartford,Conn. R2 ....8.15
Harvey,Ill. B5 ....7.65
LosAngeles(49) S30 ....9.10
LosAngeles(49) P2, R2 9.10
Mansfield,Mass. B5 ....8.20
Massillon,O. R2, R8 ....7.65
Midland,Pa. C18 ....7.65
Monaca,Pa. S17 ....7.65
Newark,N.J. W18 ....8.10
NewCastle,Pa.(17) B4 ..7.65
Pittsburgh J5 ....7.65
Plymouth,Mich. P5 ....7.90
Putnam,Conn. W18 ....8.20
Readville,Mass. C14 ....8.20
S.Chicago,Ill. W14 ....7.65
SpringCity,Pa. K3 ....8.10
Struthers,O. Y1 ....7.65
Warren,O. C17 ....7.65
Waukegan,Ill. A7 ....7.65
Willimantic,Conn. J5 ..8.15
Youngstown F3, Y1 ....7.65

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19 6.55

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ....9.025
BeaverFalls,Pa.M12,R2 9.025
Bethlehem,Pa. B2 ....9.025
Bridgeport,Conn. C32 ..9.175
Buffalo B5 ....9.025
Camden,N.J. P13 ....9.20
Canton,O. T7 ....9.025
Carnegie,Pa. C12 ....9.025
Chicago W18 ....9.025
Cleveland A7, C20 ....9.025
Detroit B5, P17 ....9.225
Detroit S41 ....9.025
Donora,Pa. A7 ....9.025
Elyria,O. W8 ....9.025
FranklinPark,Ill. N5 ..9.025
Gary,Ind. R2 ....9.025
GreenBay,Wis. F7 ....9.025
Hammond,Ind. J5, L2..9.025
Hartford,Conn. R2 ....9.325
Harvey,Ill. B5 ....9.025
Lackawanna,N.Y. B2..9.025
LosAngeles P2, S30 ..11.00
Mansfield,Mass. B5 ..9.325
Massillon,O. R2, R8 ...9.025
Midland,Pa. C18 ....9.025
Monaca,Pa. S17 ....9.025
Newark,N.J. W18 ....9.20
Plymouth,Mich. P5 ....9.225
S.Chicago,Ill. W14 ....9.025
SpringCity,Pa. K3 ....9.20
Struthers,O. Y1 ....9.025
Warren,O. C17 ....9.025
Waukegan,Ill. A7 ....9.025
Willimantic,Conn. J5 ..9.325
Worcester,Mass. A7 ..9.325
Youngstown F3, Y1 ..9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ...6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 ....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ...5.925
Kokomo,Ind. C16 .....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SandSprings,Okla. S5 ..5.925
Seattle A24, B3, N14 ..6.425
S.Chicago,Ill. R2, W14 5.675
S.Duquesne,Pa. U5 ...5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill.(1) N15 ...5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ..6.10
Torrance,Calif. C11 ..6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated: To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 ....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 ....7.35
SandSprings,Okla. S5 ..7.60
Seattle A24, B3, N14 ..7.95
SparrowsPt.,Md. B2 ..7.33
St.Paul U8 .....8.17
Williamsport,Pa. S19 ..7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt) B14 19.00
McK.Rks.(S.R.) L5 ..14.50
McK.Rks.(D.R.) L5 ..19.80
McK.Rks.(Staybolt)L5 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts.(4) C2 ...5.675
Franklin,Pa. (3) F5 ..5.575
Franklin,Pa. (4) F5 ..5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ...5.575
Tonawanda(4) B12 ....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ..5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 ....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 ....6.275

SHEETS, H.R., Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.46

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 ....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 .....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14 7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ..7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.275
Allenport,Pa. P7 .....6.275
Aliquippa,Pa. J5 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3 ..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 ....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ..7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2.6.275
Steubenville,O. W10 ..6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 ....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ...9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ...7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 ...6.875‡
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875‡
Fairfield,Ala. T2 ....6.875‡
Gary,Ind. U5 .....6.875‡
GraniteCity,Ill. G4 ...6.975*
Ind.Harbor,Ind. I-2 ..6.875‡
Irvin,Pa. U5 .....6.875‡
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10 6.875*
Middletown,O. A10 ...6.875‡
Pittsburg,Calif. C11 ..7.625*
Pittsburgh J5 .....6.875‡
SparrowsPt.,Md. B2 ..6.875‡
Warren,O. R2 .....6.875‡
Weirton,W.Va. W6 ...6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 ....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) B2 ....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ..8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A24 Alaska Steel Mills Inc.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Bethlehem Steel Co., Pacific Coast Div.
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel Div., U. S. Steel Corp.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H.K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.
M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons,John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S10 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala City, Ala. (27) R2	5.10
Allenport, Pa. P7	5.10
Alton, Ill. L1	5.30
Ashland, Ky. (8) A10	5.10
Atlanta A11	5.10
Bessemer, Ala. T2	5.10
Birmingham C15	5.10
Buffalo (27) R2	5.10
Conshohocken, Pa. A3	5.15
Detroit M1	5.10
Ecorse, Mich. G5	5.10
Fairfield, Ala. T2	5.10
Farrell, Pa. S3	5.10
Fontana, Calif. K1	5.825
Gary, Ind. U5	5.10
Ind. Harbor, Ind. I-2, Y1	5.10
Johnstown, Pa. (25) B2	5.10
Lackawanna, N.Y. (25) B2	5.10
LosAngeles (25) B3	5.85
LosAngeles C1	5.90
Minnequa, Colo. C10	6.20
Riverdale, Ill. A1	5.10
SanFrancisco S7	6.60
Seattle (25) B3	6.10
Seattle N14	6.60
Sharon, Pa. S3	5.10
S. Chicago, Ill. W14	5.10
S. SanFrancisco (25) B3	5.85
SparrowsPoint, Md. B2	5.10
Torrance, Calif. C11	5.85
Warren, O. R2	5.10
Weirton, W. Va. W6	5.10
Youngstown U6	5.10

STRIP, Hot-Rolled Alloy

Carnegie, Pa. S18	8.40
Farrell, Pa. S3	8.40
Gary, Ind. U5	8.40
Houston S6	8.85
Ind. Harbor, Ind. Y1	8.40
KansasCity, Mo. S3	8.85
LosAngeles B3	8.90
Lowellville, O. S6	8.40
Newport, Ky. A7	8.40
Sharon, Pa. A7, S3	8.40
S. Chicago, Ill. W14	8.40
Youngstown U5, Y1	8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland, Ky. A10	7.575
Bessemer, Ala. T2	7.575
Conshohocken, Pa. A3	7.575
Ecorse, Mich. G5	7.575
Fairfield, Ala. T2	7.575
Farrell, Pa. S3	7.575
Gary, Ind. U5	7.575
Ind. Harbor, Ind. I-2, Y1	7.575
Lackawanna, N.Y. B2	7.575
LosAngeles (25) B3	8.325
Seattle (25) B3	8.575
Sharon, Pa. S3	7.575
S. Chicago, Ill. W14	7.575
S. SanFrancisco (25) B3	8.325
SparrowsPoint, Md. B2	7.575
Warren, O. R2	7.575
Weirton, W. Va. W6	7.575
Youngstown U5, Y1	7.575

STRIP, Hot-Rolled Ingot Iron

Ashland, Ky. (8) A10	5.25
Warren, O. R2	5.575

STRIP, Cold-Rolled Carbon

Anderson, Ind. G6	7.425
Baltimore T6	7.425
Boston T6	7.975
Buffalo S40	7.425
Cleveland A7, J5	7.425
Dearborn, Mich. S3	7.425
Detroit D2, M1, P29	7.425
Dover, O. G6	7.425
Evanston, Ill. M22	7.225
Farrell, Pa. S3	7.425
Follansbee, W. Va. P4	7.425
Fontana, Calif. K1	9.20
FranklinPark, Ill. T6	7.825
Ind. Harbor, Ind. Y1	7.425
Indianapolis S41	7.975
LosAngeles C1, S41	9.20
McKeesport, Pa. N10	7.925
NewBedford, Mass. R10	7.875
NewBritain, Conn. S15	7.875
NewCastle, Pa. B4, R5	7.425
NewHaven, Conn. D2	7.975
NewKensington, Pa. A6	7.425
Pawtucket, R.I. R3	7.975
Pawtucket, R.I. N8	7.975
Philadelphia P24	7.875
Pittsburgh J5	7.425
Riverdale, Ill. A1	7.525
Rome, N.Y. (32) R6	7.425
Sharon, Pa. S3	7.425
Trenton, N.J. (31) R5	7.875
Wallingford, Conn. W2, T6	7.875
Warren, O. R2, T6	7.425
Worcester, Mass. A7	7.975

STRIP, Cold-Rolled Alloy

Boston T6	15.90
Carnegie, Pa. S18	15.55
Cleveland A7	15.55
Dover, O. G6	15.55
Farrell, Pa. S3	15.55
FranklinPark, Ill. T6	15.55
Harrison, N.J. C18	15.55
Indianapolis S41	15.70
LosAngeles S41	17.75
Lowellville, O. S3	15.55
Pawtucket, R.I. N8	15.90
Riverdale, Ill. A1	15.55
Sharon, Pa. S3	15.55
Worcester, Mass. A7	15.85
Youngstown S41	15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.80
Dearborn, Mich. S3	10.80
Dover, O. G6	10.80
Farrell, Pa. S3	10.80
Ind. Harbor, Ind. Y1	10.80
Sharon, Pa. S3	10.80
Warren, O. R2	10.80

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie, Pa. S18	8.35	10.40	12.60	15.80	...
Cleveland A7	8.35	10.40	12.60	15.80	18.55
Dearborn, Mich. S3	9.05	10.50	12.70	...	...
Detroit D2	9.05	10.50	12.70	15.70	...
Dover, O. G6	8.35	10.40	12.60	15.60	18.55
Evanston, Ill. M22	8.35	10.40	12.60	15.60	...
Farrell, Pa. S3	8.35	10.40	12.60	15.60	18.55
Hostoria, O. S1	10.05	10.40	12.60	15.60	...
FranklinPark, Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison, N.J. C18	...	...	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.80	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	...
LosAngeles S41	11.15	12.60	14.80	...	...
NewBritain, Conn. S15	9.10	10.70	12.90	15.90	18.85
NewCastle, Pa. B4, R5	8.35	10.40	12.60	15.60	...
NewHaven, Conn. D2	8.40	10.70	12.90	15.90	...
NewKensington, Pa. A6	8.35	10.40	12.60	15.60	...
NewYork W3	...	10.70	12.90	16.10	19.20
Pawtucket, R.I. N8	9.30	10.70	12.90	15.80	18.85
Riverdale, Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome, N.Y. (32) R6	8.35	10.40	12.60	15.60	18.55
Sharon, Pa. S3	8.35	10.40	12.60	15.60	18.55
Trenton, N.J. R5	...	10.70	12.90	15.90	18.85
Wallingford, Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren, O. T5	8.35	10.40	12.60	15.60	18.55
Worcester, Mass. A7, T6	9.50	10.70	12.90	15.80	18.85
Youngstown S41	8.35	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.30C	0.61-1.05C	1.06-1.35C
Bristol, Conn. W1	18.85	22.85	27.80
Buffalo W12	18.85	...	...
Hostoria, O. S1	18.05	22.15	...
FranklinPark, Ill. T6	18.20	23.30	28.15
Harrison, N.J. C18	18.85	22.85	27.80
NewYork W3	18.85	22.85	27.80
Palmer, Mass. W12	18.85	...	...
Trenton, N.J. R5	18.85	22.85	27.80
Worcester, Mass. A7, T6	18.85	22.85	27.80
Youngstown S41	18.20	23.30	28.15

STRIP, Galvanized (Continuous)

Farrell, Pa. S3	7.50
Sharon, Pa. S3	7.50

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Farrell, Pa. S3	5.525
Riverdale, Ill. A1	5.675
Sharon, Pa. S3	5.525
Youngstown U5	5.525

STRIP, Cold-Rolled Ingot Iron

Warren, O. R2	8.175

STRIP, C. R. Electrogalvanized

Cleveland A7	7.425*
Dover, O. G6	7.425*
Evanston, Ill. M22	7.525*
McKeesport, Pa. E10	7.50*
Riverdale, Ill. A1	7.525*
Warren, O. B9, S3, T6	7.425*
Worcester, Mass. A7	7.975
Youngstown S41, Y1	7.425*

*Plus galvanizing extras.

TIN MILL PRODUCTS

Tin PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa, Pa. J5	$9.10	9.35	$9.75
Fairfield, Ala. T2	9.20	9.45	9.85
Fairless, Pa. U6	9.20	9.45	9.85
Fontana, Calif. K1	9.75	10.00	10.40
Gary, Ind. U5	9.10	9.35	9.75
GraniteCity, Ill. G4	9.20	9.45	9.60
IndianaHarbor, Ind. I-2, Y1	9.10	9.35	9.75
Irvin, Pa. U5	9.10	9.35	9.75
Niles, O. R2	9.10	9.35	9.75
Pittsburg, Calif. C11	9.75	10.00	10.40
SparrowsPoint, Md. B2	9.10	9.35	9.75
Weirton, W. Va. W6	9.10	9.35	9.75
Yorkville, O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per lb)

Indiana Harbor, Ind. Y1 (29-27 Ga.)	7.90	...	...
Niles, O. R2 (29-27 Ga.)	7.90	8.10	8.20
Aliquippa, Pa. J5 (21-27 Ga.)	7.90	8.10	...

TIN PLATE, American 1.25 lb 1.50 lb

Aliquippa, Pa. J5	$10.40	$10.65
Fairfield, Ala. T2	10.50	10.75
Fairless, Pa. U5	10.50	10.75
Fontana, Calif. K1	11.05	11.20
Gary, Ind. U5	10.40	10.65
Ind. Harb. Y1	10.40	10.65
Pitts., Calif. C11	11.05	11.20
Sp. Pt., Md. B2	10.40	10.65
Weirton, W. Va. W6	10.40	10.65
Yorkville, O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa, Pa. J5	$8.20
Fairfield, Ala. T2	8.20
Fairless, Pa. U5	8.20
Fontana, Calif. K1	8.85
Gary, Ind. U5	8.20
GraniteCity, Ill. G4	8.30
Ind. Harbor, Ind. I-2, Y1	8.20
Irvin, Pa. U5	8.20
Niles, O. R2	8.20
Pittsburg, Calif. C11	8.85
SparrowsPoint, Md. B2	8.20
Weirton, W. Va. W6	8.20
Yorkville, O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa, Pa. J5	7.35
Gary, Ind. U5	7.35
GraniteCity, Ill. G4	7.35
Ind. Harbor, Ind. Y1	7.35
Irvin, Pa. U5	7.35
Yorkville, O. W10	7.35

MANUFACTURING TERNES (Special Coated, Base Box)

Gary, Ind. U5	$10.05
Irvin, Pa. U5	10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom, W. Va. W10	....	11.70	12.40	13.35	14.45
Brackenridge, Pa. A4	....	....	12.40	13.55	14.65
GraniteCity, Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor, Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Manafield, O. E9	9.875*	11.70	12.40	13.55	14.65
Newport, Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles, O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift, Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren, O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville, O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift, Pa. U5	8.10
Mansfield, O. E9	8.10
Warren, O. R2 (Silicon Lowerex)	8.10

SHEETS (22 Ga., coils & cut lengths)

Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom, W. Va. W10	15.70	16.30	16.80	17.85
Vandergrift, Pa. U5	15.70	16.30	16.80	17.85
Zanesville, O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-65	T-72
Brackenridge, Pa. A6	....	18.10	19.70	20.20	20.70	15.70††
Butler, Pa. A10	....	....	19.70	20.20	20.70	....
Vandergrift, Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren, O. R2	....	....	....	....	....	15.70‡

*Semiprocessed, †Fully processed only, ‡Coils, annealed; semiprocessed ½c lower, ††Coils only.

WIRE

WIRE, Manufactures Bright, Low Carbon

AlabamaCity, Ala. R2	3.00
Aliquippa, Pa. J5	3.00
Alton, Ill. L1	3.20
Atlanta A1	3.00
Bartonville, Ill. K4	3.10
Buffalo W12	3.00
Chicago W13	3.00
Cleveland A7, C20	3.00
Crawfordsville, Ind. M8	3.10
Donora, Pa. A7	3.00
Duluth A7	3.00
Fairfield, Ala. T2	3.00
Fostoria, O. (24) S1	3.10
Houston S5	3.25
Jacksonville, Fla. M8	3.35
Johnstown, Pa. B2	3.00
Joliet, Ill. A7	3.00
KansasCity, Mo. S5	3.25
Kokomo, Ind. C16	3.10
LosAngeles B3	3.95
Minnequa, Colo. C10	3.25
Monessen, Pa. P7, P16	3.00
N. Tonawanda, N.Y. B11	3.00
Palmer, Mass. W12	3.30
Pittsburg, Calif. C11	3.95
Portsmouth, O. P12	3.00
Rankin, Pa. A7	3.00
S. Chicago, Ill. R2	3.00
S. SanFrancisco C19	3.95
SparrowsPoint, Md. B2	3.10
Sterling, Ill. (1) N15	3.00
Sterling, Ill. N15	3.10
Strutners, O. Y1	3.00
Waukegan, Ill. A7	3.00
Worcester, Mass. A7	3.30

WIRE, Cold Heading Carbon

Elyria, O. W8	3.00

WIRE, Galv'd., for ACSR

Bartonville, Ill. K4	12.65
Buffalo W12	13.40
Cleveland A7	12.65
Donora, Pa. A7	12.65
Duluth A7	12.65
Johnstown, Pa. B2	13.40
KansasCity, Mo. S3	12.90
Minnequa, Colo. C10	12.775
Monessen, Pa. P7, P16	12.65
Muncie, Ind. I-7	13.60
NewHaven, Conn. A7	12.95
Palmer, Mass. W12	13.70
Pittsburg, Calif. C11	13.45
Portsmouth, O. P12	12.65
Roebling, N.J. R5	12.95
SparrowsPt., Md. B2	13.50
Strutners, O. Y1	13.40
Trenton, N.J. A7	12.95
Waukegan, Ill. A7	12.65
Worcester, Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa, Pa. J5	9.75
Alton, Ill. L1	9.95
Buffalo W12	9.75
Cleveland A7	9.75
Donora, Pa. A7	9.75
Duluth A7	9.75
Johnstown, Pa. B2	9.75
KansasCity, Mo. S5, U3	10.00
LosAngeles B3	10.70
Minnequa, Colo. C10	9.95
Monessen, Pa. P7, P16	9.75
NewHaven, Conn. A7	10.05
Palmer, Mass. W12	10.05
Pittsburg, Calif. C11	10.70
Portsmouth, O. P12	9.75
Roebling, N.J. R5	10.05
S. Chicago, Ill. R2	9.75
S. SanFrancisco C10	10.70
SparrowsPt., Md. B2	9.85
Struthers, O. Y1	9.75
Trenton, N.J. A7	10.05
Waukegan, Ill. A7	9.75
Worcester, Mass. A7, J4, T6	10.05

WIRE, Fine & Weaving(2) Coiled

Alton, Ill. L1	16.50
Bartonville, Ill. K4	16.40
Chicago W13	16.30
Cleveland A7	16.30
Crawfordsville, Ind. M8	16.40
Fostoria, O. S1	16.30
Houston S5	16.55
Jacksonville, Fla. M8	16.65
Johnstown, Pa. B2	16.30
KansasCity, Mo. S5	16.55
Kokomo, Ind. C16	16.30
Minnequa, Colo. C10	16.55
Monessen, Pa. P16	16.30
Muncie, Ind. I-7	16.50
Palmer, Mass. W12	16.60
S. SanFrancisco C10	17.15
Waukegan, Ill. A7	16.30
Worcester, Mass. A7, J6	16.60

WIRE, Tire Bead

Bartonville, Ill. K4	17.15
Monessen, Pa. P16	17.15
Roebling, N.J. R5	17.65

ROPE WIRE (A)

Bartonville, Ill. K4	13.45
Buffalo W12	13.45
Fostoria, O. S1	13.45
KansasCity, Mo. U3	13.70
Johnstown, Pa. B2	13.45
Monessen, Pa. P7	13.45
Muncie, Ind. I-7	13.65
Palmer, Mass. W12	13.75
Portsmouth, O. P12	13.45
Roebling, N.J. R5	13.75
St. Louis L3	13.45
SparrowsPt., Md. B2	13.55
Struthers, O. Y1	13.45
Worcester, Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R. I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg) to Distributors (33)

Wheeling,W.Va. W10	$10.10

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	9 34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S.Chicago,Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10 36
Sterling,Ill. (37) N15	9.24

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.65
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill. (37) N15	9.59

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill. (37) N15	9.59

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill. (7) N15	214

FENCE POSTS

Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill. (7) N15	198††

WOVEN FENCE, 9-15 Ga. Col.

Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill. (7) N15	192††

WIRE (16 gage) Stone An'ld Stone Galv.

Ala.City,Ala.R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	....
Craw'dville M8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	17.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	....
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass.W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
St'ling(37) N15	17.25	19.05††
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	....

WIRE, Merchant Quality (6 to 8 gage) An'ld Galv.

Ala.City,Ala. R2	9.00	9.55**
Aliquippa J5	8.65	9.325§
Atlanta(48)A11	9.10	9.775§
Bartonville(48) K4	9.10	9.80
Buffalo W12	9.00	9.55†
Cleveland A7	9.00	....
Crawfordsville M8	9.10	9.80‡‡
Donora,Pa. A7	9.00	9.55†
Duluth A7	9.00	9.55†
Fairfield T2	9.00	9.55†
Houston(48) S5	9.25	9.80**
Jack'ville,Fla. M8	9.10	9.80‡‡
Johnstown(48) B2	9.00	9.675§
Joliet,Ill. A7	9.00	9.55†
Kans.City(48) S5	9.25	9.80**
Kokomo(48) S16	9.10	9.65†
LosAngeles B3	9.95	10.625§
Monessen(48) P7	8.65	9.35§
Palmer,Mass. W12	9.30	9.85†
Pitts.,Calif. C11	9.95	10.50†
Rankin,Pa. A7	9.00	9.55†
S.Chicago R2	9.00	9.55**
S SanFran. C10	9.95	10.50**
Spar'wsPt.(48)B2	9.10	9.775§
St'ling(1)(48)N15	9.00	9.70‡§
Struthers,O. Y1	9.00	9.65‡
Worcester,Mass.A7	9.30	9.85†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras. §§11.50c.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts
Full Size Body (cut thread)
½ in. and smaller:
3 in. and shorter .. 55.0
3¼ in. thru 6 in. .. 50.0
Longer than 6 in. .. 37.0
⅝ in., 3 in. & shorter 47.0
3¼ in. thru 6 in. .. 40.0
Longer than 6 in. .. 31.0
¾ in. thru 1 in.:
6 in. and shorter .. 37.0
Longer than 6 in. .. 31.0
1⅛ in. and larger:
All lengths 31.0
Undersize Body (rolled thread)
½ in. and smaller:
3 in. and shorter .. 55.0
3¼ in. thru 6 in. 50.0

Carriage Bolts
Full Size Body (cut thread)& Undersize Body (rolled thread)
½ in. and smaller:
6 in. and shorter.. 48.0
Larger diameters and longer lengths 35.0

Lag, Plow, Tap, Blank Step, Elevator, Tire, and Fitting Up Bolts
½ in. and smaller:
6 in. and shorter .. 48.0
Larger diameters and longer lengths .. 35.0

High Tensile Structural Bolts (Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated, Spec. ASTM A-325, in bulk. Full keg quantity)
⅝ in. diam 50.0
¾ in. diam 47.0
⅞ and 1 in. diam. 43 0
1⅛ and 1¼ in. diam 34.0

NUTS

(Keg or case quantity and over)
Square Nuts, Reg. & Heavy:
All sizes 56.0
(Full container)
Hex Nuts, Reg. & Heavy
Hot Pressed & Cold Punched:
¾ in. and smaller.. 62.0
⅞ in. to 1½ in., incl. 56.0
1⅝ in. and larger .. 51.5
Hex Nuts, Semifinished, Heavy (Incl. Slotted):
¾ in. and smaller 62.0
⅞ in. to 1½ in. incl. 56.0
1⅝ in. and larger 51.5
Hex Nuts, Finished (Incl. Slotted and Castellated):
⅞ in. and smaller.. 65.0
1 in. to 1½ in., incl. 57.0
1⅝ in. and larger.. 51.5
Semifinished Hex Nuts, Reg. (Incl. Slotted):
⅝ in. and smaller.. 62.0
⅞ in. to ⅞ in., incl. 65.0
1 in. to 1½ in., incl. 57.0
1⅝ in. and larger.. 51.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)
Hex Head Cap Screws, Coarse or Fine Thread, Bright:
6 in. and shorter:
⅝ in. and smaller.. 35.0
¾, ⅞, and 1 in. .. 16.0
Longer than 6 in.:
⅝ in. and smaller.. 3.0
¾, ⅞, and 1 in. ..+11.0
High Carbon, Heat Treated:
6 in. and shorter:
⅝ in. and smaller. 20.0
¾, ⅞, and 1 in. ..+ 5.0
Longer than 6 in.:
⅝ in. and smaller..+19.0
¾, ⅞, and 1 in. ..+39.0
Flat Head Cap Screws:
¾ in. and smaller, 6 in. and shorter ..+85.0
Setscrews, Square Head, Cup Point, Coarse Thread:
Through 1 in. diam:
6 in. and shorter ..+ 5.0
Longer than 6 in. ..+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.
Structural ½ in., larger 12.85, 7/16 in. and smaller by 6 in. and shorter: 15% off list.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	27.24	23.13
1¼	13	....	32.25	24.41
1½	13	30.42	35.65	26.98
1¾	13	35.94	42.12	31.89
2	13	40.28	47.21	35.74
2¼	13	45 36	53.17	40.26
2½	12	49.24	57.72	43.70
2½	12	54.23	63.57	48.13
2¾	12	58.73	68.83	52.13
3	12	62.62	73.40	55.59

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....	(16)6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh S44	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	10.10
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25c in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) New Haven, Conn., base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

STRIP

STRIP, Hot-Rolled Carbon

Ala City,Ala.(27) R2 ...5.10
Allenport,Pa. P7 .....5.10
Alton,Ill L1 .....5.30
Ashland,Ky.(8) A10 ....5.10
Atlanta A11 .....5.10
Bessemer,Ala. T2 .....5.10
Birmingham C15 .....5.10
Buffalo(27) R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind U5 .....5.10
Ind.Harbor,Ind. I-2, Y1..5.10
Johnstown,Pa.(25) B2 ..5.10
Lackaw'na,N.Y.(25) B2.5.10
LosAngeles(25) B3 ....5.85
LosAngeles C1 .....8.60
Minnequa,Colo. C10 ....6.20
Riverdale Ill. A1 .....5.10
SanFrancisco S7 .....6.60
Seattle(25) B3 .....6.10
Seattle N14 .....6.60
Sharon,Pa. S3 .....5.10
S.Chicago Ill. W14 .....5.10
S.SanFrancisco(25) B3 ..5.85
SparrowsPoint,Md. B2 ..5.10
Torrance,Calif. C11 ....5.85
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5 .....5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18 .....8.40
Farrell,Pa. S3 .....8.40
Gary,Ind. U5 .....8.40
Houston S5 .....8.65
Ind.Harbor,Ind. Y1 ....8.40
KansasCity,Mo. S5 ....8.65
LosAngeles B3 .....9.60
Lowellville,O. S3 .....8.40
Newport,Ky. A2 .....8.40
Sharon,Pa. A2, S3 ....8.40
S.Chicago,Ill. W14 ....8.40
Youngstown U5, Y1 ....8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10 .....7.575
Bessemer,Ala. T2 ....7.575
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.575
Fairfield,Ala. T2 ....7.575
Farrell,Pa. S3 .....7.575
Gary,Ind. U5 .....7.575
Ind.Harbor,Ind. I-2, Y1 7.575
Lackawanna,N.Y. B2 ..7.575
LosAngeles(25) B3 ....8.325
Seattle(25) B3 .....8.575
Sharon,Pa. S3 .....7.575
S.Chicago,Ill. W14 ....7.575
S.SanFrancisco(25) B3 8.325
SparrowsPoint,Md. B2 7.575
Warren,O. R2 .....7.575
Weirton,W.Va. W6 ....7.575
Youngstown U5, Y1 ...7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ....5.35
Warren,O. R2 .....5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....7.425
Baltimore T6 .....7.425
Boston T6 .....7.975
Buffalo S40 .....7.425
Cleveland A7, J5 .....7.425
Dearborn,Mich. S3 ....7.425
Detroit D2, M1, P20..7.425
Dover,O G6 .....7.425
Evanston,Ill. M22 .....7.525
Farrell,Pa. S3 .....7.425
Follansbee,W.Va. F4 ..7.425
Fontana,Calif. K1 .....9.20
FranklinPark,Ill. T6 ..7.525
Ind.Harbor,Ind. Y1 ...7.425
Indianapolis S41 .....7.575
LosAngeles C1, S41 ....9.30
McKeesport,Pa E10 ...7.525
NewBedford,Mass. R10.7.875
NewBritain,Conn. S15..7.875
NewCastle,Pa B4, E5..7.425
NewHaven,Conn. D2 ..7.875
NewKensington,Pa. A6 7.425
Pawtucket,R I R3 ....7.975
Pawtucket R I. N8 ....7.975
Philadelphia P24 .....7.875
Pittsburgh J5 .....7.425
Riverdale,Ill A1 .....7.525
Rome,N Y (32) R6 ....7.425
Sharon Pa S3 .....7.425
Trenton,N.J.(31) R5 ..8.875
Wallingford,Conn. W2..7.875
Warren,O R2, T5 ....7.425
Worcester,Mass. A7 ...7.975

STRIP, Cold-Rolled Alloy

Boston T6 .....15.90
Carnegie,Pa. S18 .....15.55
Cleveland A7 .....15.55
Dover,O. G6 .....15.55
Farrell,Pa. S3 .....15.55
FranklinPark, Ill. T6 ..15.55
Harrison,N.J. C18 ....15.55
Indianapolis S41 .....15.70
LosAngeles S41 .....17.75
Lowellville,O. S3 .....15.55
Pawtucket,R.I. N8 ....15.90
Riverdale,Ill. A1 .....15.55
Sharon,Pa. S3 .....15.55
Worcester,Mass. A7 ...15.85
Youngstown S41 .....15.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7 .....10.80
Dearborn,Mich. S3 ....10.80
Dover,O. G6 .....10.80
Farrell,Pa. S3 .....10.80
Ind.Harbor,Ind. Y1 ...10.80
Sharon,Pa. S3 .....10.80
Warren,O. R2 .....10.80

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10 70	12 90	15 90	18 85
Boston T6	9.50	10 70	12 90	15 90	18.85
Bristol,Conn. W1	...	10.70	12 90	16 10	19.30
Carnegie,Pa. S18	8.95	10 40	12 60	15.60	....
Cleveland A7	8.95	10.40	12 60	15.60	18.55
Dearborn,Mich. S3	9.05	10 50	12.70	....	....
Detroit D2	9.05	10.50	12 70	15.70	....
Dover,O G6	8.95	10 40	12.60	15 60	18.55
Evanston,Ill. M22	8.95	10.40	12 60	15 60	....
Farrell Pa. S3	8.95	10.40	12.60	15 60	18.55
Fostoria,O. S1	10.05	10.40	12 60	15 60	....
FranklinPark,Ill. T6	9.05	10.40	12 60	15 60	18.55
Harrison N.J C18	....	.. ..	12 90	16 10	19 30
Indianapolis S41	9.10	10.55	12.60	15 60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10 70	12 90	15.90	18.85
NewCastle Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10 70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12 60	15 60	....
NewYork W3	..	10.70	12 90	16.10	19.30
Pawtucket,R.I. N8	9.50	10 70	12 90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15 60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15 60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15 60	18.55
Trenton,N.J. R5	...	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10 70	12.90	15 90	18.75
Warren,O. T5	8.95	10.40	12.60	15 60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18 85	22.95	27.80
Buffalo W12	18.85	....	....
Fostoria,O. S1	19.05	22.15	....
FranklinPark,Ill. T6	19.20	23 30	28.15
Harrison,N.J. C18	18.85	22.95	27.80
NewYork W3	18.85	22.95	27.80
Palm r.Mass W12	18.85	....	....
Trenton N.J. R5	18.85	22.95	27.80
Worcester,Mass. A7, T6	18.85	22.95	27.80
Youngstown S41	19.20	23.30	28.15

STRIP, Galvanized (Continuous)

Farrell Pa. S3 .....7.50
Sharon,Pa. S3 .....7.50

TIGHT COOPERAGE HOOP

Atlanta A11 .....5.65
Farrell,Pa. S3 .....5.525
Riverdale,Ill. A1 .....5.675
Sharon,Pa. S3 .....5.525
Youngstown U5 .....5.525

Weirton,W.Va. W6 ....10.80
Youngstown Y1 .....10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....8.175

STRIP, C. R. Electrogalvanized

Cleveland A7 .....7.425*
Dover,O. G6 .....7.425*
Evanston,Ill. M22 ....7.525*
McKeesport,Pa. E10 ..7.50*
Riverdale,Ill. A1 ....7.525*
Warren,O. B9, S3, T5.7.425*
Worcester,Mass. A7 ...7.975
Youngstown S41, Y1..7.425*

*Plus galvanizing extras.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa J5	$9.10	$9 35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9 45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per lb)

IndianaHarbor,Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fairless,Pa. U5	10 50	10.75
Fontana,Calif.K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10 40	10 65
Pitts.,Calif. C11.	11.05	11.30
Sp.Pt.,Md. B2	10 40	10 65
Weirton,W.Va. W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa Pa J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.20
Weirton W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	7.85
Gary,Ind U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. Y1	7.85
Irvin,Pa U5	7.85
Yorkville,O W10	7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$10.05
Irvin,Pa. U5	10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom W Va. W10	....	11.70	12 40	13 35	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	.....	9.975*11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	..	9.875*11.20*	11.90*	13.05*	....
Mansfield,O. E6	.....	9.875*11.70	12.40	13.55	14.65
Newport,Ky. A2	.....	9.875 11.70*	12.40*	13.55*	14.65*
Niles,O. M21	.....	9.875*11.70	12.40	13.55	....
Vandergrift,Pa. U5	.....	9.875*11.70	12.40	13.55	14.65
Warren,O. R2	.....	9.875*11.70	12.40	13.55	14.65
Zanesville,O. A10	.....	....11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths)	T-72	T-65	T-58	T-52
Fully Processed (Semiprocessed ½c lower)				
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.) — Grain Oriented

	T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19 70	20.20	20 70	15.70††
Butler,Pa. A10	....	....	....	19.70	20.20	20.70 ....
Vandergrift,Pa. U5	..	17.10	18.10	19.70	20.20	20.70 15.70
Warren,O. R2	.....	....	....	....	....	.... 15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..8.00
Aliquippa,Pa. J5 .....8.00
Alton,Ill. L1 .....8.20
Atlanta A1 .....8.00
Bartonville,Ill. K4 ....8.10
Buffalo W12 .....8.00
Chicago W13 .....8.00
Cleveland A7, C20 ....8.00
Crawfordsville,Ind. M8 8.10
Donora,Pa. A7 .....8.00
Duluth A7 .....8.00
Fairfield,Ala. T2 .....8.00
Fostoria,O.(24) S1 ....8.10
Houston S5 .....8.25
Jacksonville,Fla. M8 ..8.35
Johnstown,Pa. B2 ....8.00
KansasCity,Mo. S5 ....8.25
Kokomo,Ind. C16 .....8.10
LosAngeles B3 .....8.95
Minnequa,Colo. C10 ....8.25
Monessen,Pa. P7, P16 ..8.00
N Tonawanda,N.Y. B11 .8.00
Palmer,Mass. W12 ....8.30
Pittsburg,Calif. C11 ...8.95
Portsmouth,O. P12 ....8.00
Rankin,Pa A7 .....8.00
S.Chicago,Ill. R2 .....8.00
S SanFrancisco C10 ....8.95
SparrowsPoint,Md. B2 ..8.10
Sterling,Ill.(1) N15 ....8.00
Sterling,Ill. N15 .....8.10
Struthers,O. Y1 .....8.00
Waukegan,Ill. A7 .....8.00
Worcester,Mass. A7 ....8.30

WIRE, Cold Heading Carbon

Elyria,O W8 .....8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4 ....12.65
Buffalo W12 .....13.40
Cleveland A7 .....12.65
Donora,Pa. A7 .....12.65
Duluth A7 .....12.65
Johnstown,Pa. B2 ....13.40
KansasCity,Mo. U3 ...12.90
Minnequa,Colo. C10 ..12.775
Monessen,Pa. P7, P16..12.65
Muncie,Ind. I-7 .....13.60
NewHaven,Conn. A7 ...12.95
Palmer,Mass. W12 ....13.70
Pittsburg,Calif. C11 ...13.45
Portsmouth,O. P12 ....12.65
Roebling,N.J. R5 ....12.95
SparrowsPt.,Md. B2 ...13.50
Struthers,O Y1 .....13.40
Trenton,N.J. A7 .....12.95
Waukegan,Ill. A7 ....12.65
Worcester,Mass. A7 ...12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Johnstown,Pa. B2 .... 9 75
KansasCity,Mo. S5, U3.10.00
LosAngeles B3 .....10 70
Minnequa,Colo. C10 ....9.95
Monessen,Pa P7, P16 ..9 75
NewHaven,Conn. A7 ..10.05
Palmer,Mass W12 ....10.05
Pittsburg,Calif. C11 ...10.70
Portsmouth,O. P12 ....9.75
Roebling,N.J. R5 .....10.05
S.Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 ...10.70
SparrowsPt.,Md. B2 ....9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Worcester,Mass. A7 ...10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5 .....9.75
Alton,Ill. L1 .....9.95
Bartonville,Ill. K4 ....9.85
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora,Pa. A7 .....9.75
Duluth A7 .....9.75
Fostoria,O. S1 .....9.80
Johnstown,Pa. B2 ....9.75
KansasCity,Mo. S5, U3.10.00
LosAngeles B3 .....10.70
Milbury,Mass.(12) N6..10.05
Minnequa,Colo. C10 ....9.95
Monessen,Pa. P7, P16 ..9.75
Muncie,Ind. I-7 .....9.95
Palmer,Mass. W12 ....10.05
Pittsburg,Calif. C11 ...10.70
Portsmouth,O. P12 ....9.75
Roebling,N.J. R5 ....10.05
S Chicago,Ill. R2 .....9.75
S.SanFrancisco C10 ...10.70
SparrowsPt.,Md. B2 ....9.85
Struthers,O. Y1 .....9.75
Trenton,N.J. A7 .....10.05
Waukegan,Ill. A7 ....9.75
Wor'ster,Mass.A7,J4,T6 10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1 .....16.50
Bartonville,Ill. K4 ....16.40
Chicago W13 .....16.30
Cleveland A7 .....16.30
Crawfordsville,Ind. M8.16.40
Fostoria,O. S1 .....16 30
Houston S5 .....16.55
Jacksonville,Fla. M8 ..16.65
Johnstown,Pa. B2 ....16.30
KansasCity,Mo. S5 ....16.55
Kokomo,Ind. C16 .....16.30
Minnequa,Colo. C10 ....16.55
Monessen,Pa. P16 .....16.30
Muncie,Ind. I-7 .....16.50
Palmer,Mass. W12 .....16.60
S.SanFrancisco C10 ...17.15
Waukegan,Ill. A7 .....16.30
Worcester,Mass. A7, J6.16.60

WIRE, Tire Bead

Bartonville,Ill. K4 ....17.15
Monessen,Pa. P16 ....17.15
Roebling,N.J. R5 ....17.65

ROPE WIRE	(A)
Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
KansasCity,Mo. U3	13.70
Johnstown,Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth,O. P12	13.45
Roebling,N.J. R5	13.75
St.Louis L8	13.45
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R. I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7 ... $10.30

NAILS, Cut (100 lb keg) to Distributors (33)

Wheeling,W.Va. W10 .. $10.10

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S.Chicago,Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill. (37) N15	9.24

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	9.64
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.26
S.Chicago,Ill. R2	9.54
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill.(37) N15	9.54

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	9.59

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage)

	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	....
Craw'dville M8	17.95	19.80‡‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	17.95	19.80‡‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	....
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass.W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
St'ling(37) N15	17.25	19.05††
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	....

WIRE, Merchant Quality

	(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	9.00	9.55**
Aliquippa J5	8.65	9.325§
Atlanta(48)A11	9.10	9.775§
Bartonville(48) K4	9.10	9.80
Buffalo W12	9.00	9.55†
Cleveland A7	9.00	....
Crawfordsville M8	9.10	9.80‡‡
Donora,Pa. A7	9.00	9.55†
Duluth A7	9.00	9.55†
Fairfield T2	9.00	9.55†
Houston(48) S5	9.25	9.80**
Jack'ville,Fla. M8	9.10	9.80‡‡
Johnstown(48) B2	9.00	9.675§
Joliet,Ill. A7	9.00	9.55†
Kans.City(48) S5	9.25	9.80**
Kokomo(48) S16	9.10	9.65†
LosAngeles B3	9.95	10.625§
Monessen(48) P7	8.65	9.35§
Palmer,Mass. W12	9.30	9.85†
Pitts.,Calif. C11	9.95	10.50†
Rankin,Pa. A7	9.00	9.55†
S.Chicago R2	9.00	9.55**
S SanFran. C10	9.95	10.50**
Spar'wsPt.(48)B2	9.10	9.775§
St'ling(1)(48)N15	9.00	9.70‡‡§
Struthers,O. Y1	9.00	9.65‡
Worcester,Mass.A7	9.30	9.85†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras. §§11.50c.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts

Full Size Body (cut thread)
½ in. and smaller:

3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
¾ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1⅛ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)
½ in. and smaller:

3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts

Full Size Body (cut thread)& Undersize Body (rolled thread)
½ in. and smaller:

6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

Lag, Plow, Tap, Blank Step, Elevator, Tire, and Fitting Up Bolts
½ in. and smaller:

6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts (Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated, Spec. ASTM A-325, in bulk. Full keg quantity)

⅝ in. diam	50.0
¾ in. diam	47.0
⅞ and 1 in. diam.	43 0
1⅛ and 1¼ in. diam	34.0

NUTS

(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy

Hot Pressed & Cold Punched:

⅜ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

⅜ in. and smaller	62.0
⅞ in. to 1½ in. incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅞ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	62.0
¾ in. to ⅞ in., incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:

6 in. and shorter:

⅝ in. and smaller	35.0
¾, ⅞, and 1 in.	16.0
Longer than 6 in.:	
⅝ in. and smaller	3.0
¾, ⅞, and 1 in.	+11.0

High Carbon, Heat Treated:
6 in. and shorter:

⅝ in. and smaller.	20.0
¾, ⅞, and 1 in.	+ 5.0

Longer than 6 in.:

⅝ in. and smaller	+19.0
¾, ⅞, and 1 in.	+39.0

Flat Head Cap Screws:

¾ in. and smaller, 6 in. and shorter	+85.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam:	
6 in. and shorter	+ 5.0
Longer than 6 in.	+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85, 7/16 in. and smaller by 6 in. and shorter: 15% off list.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	27.24	23.13
1¼	13	....	32.25	24.41
1½	13	30.42	35.65	26.98
1¾	13	35.94	42.12	31.89
2	13	40.28	47.21	35.74
2¼	13	45 36	53.17	40.26
2½	12	49.24	57.72	43.70
2½	12	54.23	63.57	48.13
2¾	12	58.73	68.83	52.13
3	12	62.62	73.40	55.59

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....(16)	6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh S44	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	10.10
Ind.Harbor,Ind. I-2,Y1	10.10
KansasC.ty,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.60
Seattle B3	10.10
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1½ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.: 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. F6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	2.5	+24	+10.5	+34	+21.5	+43	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+5.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.25	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt. Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on price or zinc at 11.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	25.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	26.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	29.50	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	31.25	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	36.25	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	47.50	64.50	68.50	71.25	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.50	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Jos'yn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless	....	....	....	....	37.50
302	....	....	....	....	39.75
304	26.05	28.80	31.55	34.30	....
304L	30.50	33.75	36.95	40.15	58.25
316	38.20	42.20	46.25	50.25	....
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	47.25
321	31.20	34.50	37.75	41.05	57.00
347	36.90	40.80	44.65	48.55	....
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	$36.20	$43.15

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	V-Cr Hot Work (H-13)	0.550
Spec. Carbon (W-1)	0.385	W-Cr Hot Work (H-12)	0.530
Oil Hardening (O-1)	0.505	W Hot Wk. (H-21)	1.425-1.44
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	....	T-1	1.840
18	4	2	....	....	T-2	2.005
13.5	4	3	....	....	T-3	2.105
18.25	4.25	1	4.75	....	T-4	2.545
18	4	2	9	....	T-5	2.915
20.25	4.25	1.6	12.95	....	T-6	4.330
13.75	3.75	2	5	....	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward,Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T3	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago, Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld	....	67.95	67.95	68.48
McKeesRocks,Pa. deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.23	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield,Ohio, deld.	71.30	....	71.80	72.30

	Basic	No. 2 Foundry	Malleable	Bessemer
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry. K2	89.00
Keokuk,Iowa O.H. & Fdry. 12½ lb piglet, 16% Si, K2	92.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood,Tenn. T3 (Phos. 0.035% max)	73.00
Troy,N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075%)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Indermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24#	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85#	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.90
Boston	10.07	11.12	11.92	53.50	12.17	10.19	13.30#	15.64	10.64	10.27	11.95
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45#	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.90	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.43	8.83	9.31	11.53#	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	11.00	52.33	8.63	9.10	11.25#	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.20	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25#	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.30	53.08	9.64	9.99	13.25#	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9.15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	8.20	9.55	10.61	52.71	9.25	9.40	11.95#	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25#	15.05	9.00	8.89	10.20
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.49	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.60	16.25	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[3]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.30	11.55	12.50	57.38	10.75	11.00	14.70	16.80	10.20	10.10	13.00
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡ ⅝ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill. Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E Chicago, Ind., Joliet, Rockdale Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E Chicago, Ind., St Louis $168; Canon City, Colo., $183; Curtner, Calif., $185.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N J., Canon City, Colo., $140; Philadelphia Clearfield Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅝ in. grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Ores

Lake Superior Iron Ore

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, concentrates .. nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	21.00
Brazilian iron ore 68.5%	22.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$12.50-13.00*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian 91.5c-96.5c, nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia Baltimore, Charleston, S C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$42.00-44.00†
48% 2.8:1	38.00-40.00†
48% no ratio	29.00-31.00†

South African Transvaal

44% no ratio	19.75-21.00
48% no ratio	29.00-31.00

Turkish

48% 3:1	51.00-55.00†

Domestic

Rail nearest seller

18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked .. $1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55%	$2 25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

†Nominal.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$64.00
2½	30	41.50
3	40	39.25
4	40	37 00
5½	40	36.50
6	60	33.25
7	60	29.75
8, 9, 10	60	29 50
12	72	28.25
14	60	28.25
16	72	27.25
17	60	27.25
18	72	27.00
20	72	26.50
24	84	27.25

CARBON

8	60	14.25
10	60	13.80
12	60	14 75
14	60	14.75
14	72	12.55
17	60	12 65
17	72	12.10
20	90	11.55
24	72, 84	11.95
24	96	12.10
30	84	12.00
35, 40	110	11.60
40	100	12.50

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, domestic and foreign, 98% Fe, min, truckiots freight allowed east of Mississippi River:	
100 mesh, bags	11.25
100 mesh, pails	9.10‖
40 mesh, bags	8.10††
Electrolytic Iron, Melting stock, 99.87% Fe, irreg. fragments, ⅛ in. x 1.3 in.	28.75
1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	36.00
Unannealed (99+% Fe) (minus 325 mesh)	59.00
Powder Flake (minus 16, plus 100 mesh)	29.00
Carbonyl Iron:	
98.1-98.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atomized, 500-lb drum, freight allowed, c.l. 38.50; ton lots 40.50.	
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	34.10-50.70†
Bronze, 5000-lb lots	52.20-56.20†
Copper, electrolytic	14.25*
Copper, reduced	14.25*
Lead	7.50*
Manganese, Electrolytic: Minus 50 mesh	43.00
Nickel	80.60
Nickel-Silver, 5000-lb lots	52.70-57.10†
Phosphor-Copper, 5000-lb lots	64.60
Copper (atomized) 5000-lb lots	45.10
Solder	7.00*
Stainless Steel, 304	$0.89
Stainless Steel, 316	$1.07
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20‡
Tungsten:	Dollars
Carbon reduced, 98.8% min, minus 65 mesh	nom.**
Chromium electrolytic 99.8% Cr, min metallic basis	5.00

*Plus cost of metal. †Depending on composition: ‡Depending on mesh. §Cutting and scarfing grade. **Depending on price of ore. ††Welding grade.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50

Ovens Foundry Coke

Birmingham, ovens	$30.35
Cincinnati, deld.	33 34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw Mich., deld.	35 53
Erie, Pa., ovens	32.00
Everett, Mass., ovens: New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearny N. J., ovens	31 25
Milwaukee ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.73
Swedeland Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid; based on current ocean rates with any rise for buyer's acc't Source of shipment: Western Europe)

	North Atlantic	Great Lakes	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5 80	$5 80	$5 75	$5 65	$6.11
Bar Size Angles	5.30	5 30	5.25	5.10	5.56
Structural Angles	5 68	5 68	5.63	5.53	5.98
I-Beams	5.31	5.31	5.31	5.21	5.65
Channels	5 26	5.26	5.26	5.16	5.60
Plates (basic bessemer)	5.65	5.65	5.60	5.50	5.96
Sheets, H.R.	8.30	8.30	8.30	8 10	8.60
Sheets, Galvanized, 20 Ga., 36 in. x 96 in.	9.52	9.52	9.47	9.37	9.83
Sheets, Galv (in coils) 20 Ga., 48 in. wide	9.58	9.58	9.53	9.43	9.89
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	8.60	9.12
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.76	25.76	25.64	25.64	26.51
Barbed Wire (†)	6.68	6.68	6.58	6.52	6.75
Merchant Bars	5.90	5.90	5.85	5.65	6.11
Hot-Rolled Bands	7.15	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	5.70	5.70	5.70	5.50	5.85
Wire Rods, O H. Cold Heading Quality No. 5.	6.30	6.30	6.30	6.20	6.55
Bright Common Wire Nails (‖)	7.65	7.65	7.65	7.65	7.95

†Per 82 lb net reel. ‖Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.

Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	24.00
Naphthalene, 78 deg	5.00
Toluene, one deg (del. east of Rockies)	25.00

Cents per lb. f.o.b. tank cars or tank trucks, deld.

Phenol, 90 per cent grade	14.75

Per net ton bulk f.o.b. cars or trucks, plant

Ammonium sulfate, regular grade	$32.00

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Ferroallys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max. P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn; packed, carload 26.8c, ton lot 28.4c, less ton 29.6c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18.5-21% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.2c from above prices. For 3% grade, Si 12.5-16%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $250 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot $255.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $300 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $305.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: C.l. lump, bulk, 28.75c per lb of contained Cr. Delivered.

Charge Chrome 1: Cr 63%, C 6% max, Si 7% max, 22c. Charge Chrome 2: Cr 50-59%, C 8% max, Si 6% max, 23c. Carload, lump, bulk, per lb Cr.

Refined Chrome 1: Cr 50-59%, C 5% max, Si 2% max, 25c. Refined Chrome 2: Si 12% max, 24c. Carload, lump, bulk, per lb Cr.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Delivered.

Cr 67-71%, carload, lump, bulk, 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). 8M x D, carload bulk 20.05c per lb of alloy, caroad packed, 21.25c, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si, 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed, 2" x D plate (about ⅛" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Carload, lump, bulk, 14.6c per lb contained Si, packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Keokuk, Iowa; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload bulk 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3⅝ lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 14.8c per lb of briquet; c.l., packed, bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). C.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c, 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 8c per lb or briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9 6c; 2000 lb to c.l.; bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb, f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.1% max). Ton lots 2" x D, $3.45 per lb of contained Cb; less ton lots $3.50 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots $3.10.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carlot bulk 19.25c per lb of alloy, c.l. packed ½ in. x 12 M 20.00c, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-3 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo., in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.

(*Concluded from Page* 118)

straight month, amounting to 294,127 tons, which was the best monthly figure since last October. Total shipments for the first five months were 1,295,627 tons, 19 per cent below those in the like period last year.

Backlogs as of May 31 stood at 1,768,429 tons, of which 1,150,558 tons were scheduled for fabrication during the four months ending Sept. 30.

Wide flange beams are continuing to set the pace in the structural market. Demand is strong, and producers are booked well into August. The July book on standard structurals doesn't look quite as good as last month's, but railroad carbuilders are still buying heavily. A major factor in the market since April, they've ordered substantial tonnages for July, August, and September. Strike or no strike, steelmakers are confident that the railroad orders on their books will stick.

No large shape awards are pending in the Pacific Northwest and fabricating plants there are having some labor trouble.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

600 tons, Montana State overpass, Helena, to Creamer Industries Inc., Ft. Worth, Tex., Sletten Construction Co. general contractor.

235 tons, river crossing towers, Philadelphia Electric Co., Chester, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

140 tons, switchyard structure, Ft. Peck Dam and reservoir, U. S. Engineer, Riverdale, N. Dak., to Creamer Industries Inc., Ft. Worth, Tex.

100 tons, tower and foundation, Burns Air Station, Oregon State, to Steel Construction Co. of Oregon; low at $61,400 to the U. S. Engineer, Portland, Oreg.

STRUCTURAL STEEL PENDING

3233 tons, state bridgework, Passaic and Bergen Counties, New Jersey, bids July 16; also, 700 tons of reinforcing steel.

700 tons, state bridgework, Passaic and Bergen Counties, New Jersey, bids July 16; also, 3233 tons of structural steel.

500 tons or more, government furnished; 85 ft radar towers and buildings; low bids to U. S. Engineer, Seattle, as follows: Cottonwood Air Base, Idaho, Canady Construction Co., Seattle, $649,499; Baker Air Base, Oregon, George A. Moore & Associates, Portland, Oreg., $685,500; Mt. Hebo Air Base, Oregon, Max J. Kuney Co., Spokane, Wash., $690,600.

250 tons, Union Pacific Railroad bridge, Salina, Kans.; bids July 9 to U. S. Engineer, Kansas City, Mo.; center span, about 58 ft, plate girder construction.

REINFORCING BARS . . .

REINFORCING BARS PLACED

500 tons, Southeast Seattle School, Seattle, to Bethlehem Pacific Coast Steel Corp.; also 100 tons for the same project to Soule Steel Co., Seattle; Lloyd Johnson and Morrison-Knudsen Co. Inc., Seattle, general contractors.

125 tons, Capehart housing project, Whidbey Island, Wash., to Northwest Steel Rolling Mills Inc., Seattle.

REINFORCING BARS PENDING

259 tons, Washington State highway bridge, Yakima County; Quigg Bros.-McDonald Inc., Hoquiam, Wash., general contract at $239,280.

200 tons, Idaho road project; Payette County; bids to Boise July 14.

50 tons, Washington State girder bridge, Lewis County; general contract to Wilson & Simpson, Port Angeles, Wash., low at $45,734.

Unstated, electronics shop building, Larson Air Field; Ruud Construction Co., Spokane, Wash., low at $276,750 to U. S. Engineer.

Unstated, six-story concrete addition to Deaconess Hospital, Spokane, Wash.; bids July 27.

Unstated, operations building, Atlas launcher sites, Fairchild Air Base; general award to Henry George & Sons, Spokane, Wash., low at $1,415,169.

Unstated, residence hall, Montana State College, Bozeman, Mont.; bids to State Board of Education, Helena, Mont., July 14.

PLATES . . .

PLATES PENDING

Unstated, 25,200 ft 42 in. water transmission main, Evans, N. Y.; bids July 9, Erie County Water Authority, Buffalo.

100 tons or more, 500,000 gal watertank bids to Raleigh Water District, Washington County, Oregon, July 13; E. W. Carter, Portland, Oreg., engineer.

PIPE . . .

CAST IRON PIPE PENDING

200 tons or more, 19,300 ft of 4, 6, and 8 in.; bids in July 1 to King County District No. 79, Seattle.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Texas & Pacific, 115 fifty-ton boxcars and 35 fifty-ton refrigerator cars, to own shops. Chesapeake & Ohio, major repairs to 75 boxcars; contract to own shop at Raceland, Ky.

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Scrap Strengthens at Some Points

STEEL's index is up 33 cents to $36.83, as market firms up following extension of steel labor negotiations. Some mills lift embargoes on incoming shipments. Buying picks up

Scrap Prices, Page 132

• **Pittsburgh** — Extension of the steel labor negotiations has had little impact on the market. Steelmakers revised plans to divert inbound industrial scrap to dealers' yards, but they didn't increase their purchases. Since there's no guarantee a settlement can be reached before the new deadline, buyers won't permit local yards to ship after July 10. Before the extension was announced, Fisher Body Div. of General Motors Corp. sold its factory bundles to brokers for $46.25 to $46.75 (vs $43.50 a month ago). Now it looks like the buyers will have trouble unloading them at a profit.

• **Chicago**—Continuation of steelmaking operations at least until July 15 has resulted in little change in the local scrap market. But the strike of lake sailors has served to put prices up. Several mills which had shut off incoming scrap shipments during the last week in June have allowed shipments to resume.

Extension of the steel wage contract talks seems to have lessened the prospect for a strike and should strengthen scrap demand. Some evidence indicates brokers may do some stockpiling of material while mill buying is slack, and this would tend to keep prices firm.

The closing of foundries for mass vacations has started and is easing demand for cast iron grades.

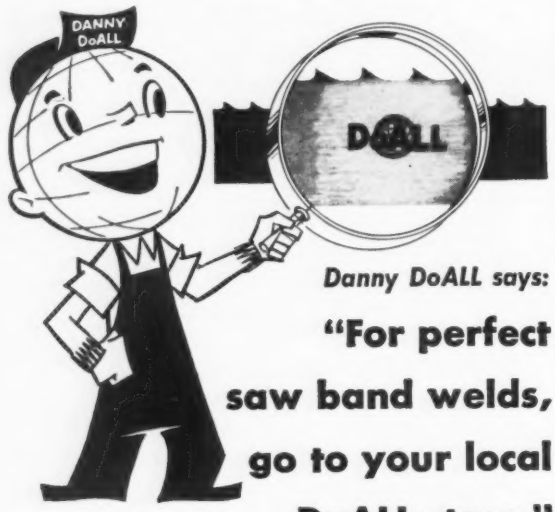
• **Philadelphia**—Prices are strong, with advances being chalked up on electric furnace bundles and heavy breakable cast. Electric furnace bundles are now quoted $40, and heavy breakable $43. Change in the steel strike deadline from June 30 to July 15 has released some orders, but the market is being more noticeably affected by continued strong export demand.

For the first time in several months, the Fairless Works (U. S. Steel) entered the market here for scrap, closing on a quantity of No. 2 bundles at $28, delivered. The price represents an advance of $4 a ton.

It's anticipated that 27,000 to 30,000 tons of scrap will leave this port for export in July, indicating a further uptrend. Shipments abroad from here totaled 55,000 tons in the second quarter vs. 17,000 in the first.

• **New York** — Brokers have advanced their buying prices on unstripped motor blocks $1 a ton to $25-$26. No other changes are reported, but quotations on most grades are strong.

Contributing to the general market strength is a brisk export demand. Some pickup in domestic buying is expected. Several mills



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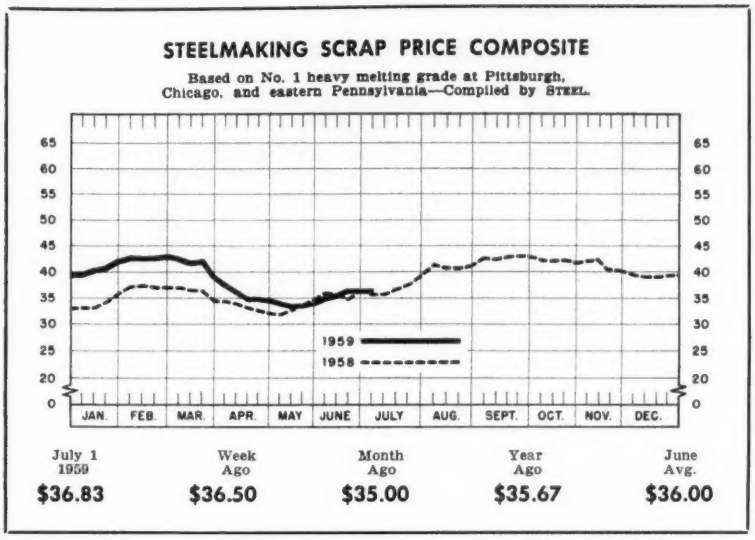

prior to the deferment of the deadline to July 15, had held up scrap intake beginning June 20.

• **Cleveland** — Following extension of the wage negotiations to July 15, some scrapyards were instructed to resume shipments of tonnage to the mills on old orders. However, it's understood a new cutoff date for shipments has been set at July 10, which would give the mills sufficient time to unload cars before the new strike deadline.

The tone of the market appears a little stronger, but no real test of strength is expected until uncertainty in the labor situation is removed. Cast iron grades have been strong, but the movement to foundries is slowing down with the vacation season at hand.

• **Detroit**—The market is stronger. Auto list bids were up $2, but there has been no open buying, so a definite level of prices has not been established. Dealer transactions are expected to pick up as soon as the auto scrap starts moving out of the plants. There is talk that extension of the steel labor negotiations may cause more activity in the scrap market this week.

• **Buffalo** — Except for continued shipments of cast iron to foundries, the scrap market is at a virtual standstill here as the trade awaits developments in the steel labor situation. Shipments to the steel mills have been embargoed since June 20.

Dealers are continuing to take in material and are stockpiling. Most yards were pretty well cleaned out by the heavy outgoing shipments in recent weeks. If the mills are tied up by a long strike, the foundries will be the only market open, and they are likely to buy sparingly.

(*Please turn to Page* 137)

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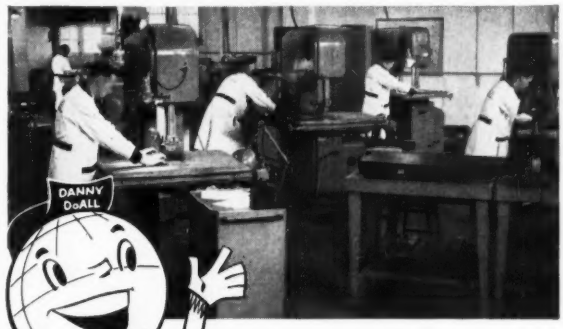

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Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, July 1, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

July 1	$36.83
June 24	36.50
June Avg.	36.07
July 1958	37.54
July 1954	27.42

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsyvania.

PITTSBURGH

No. 1 heavy melting	36.00-37.00
No. 2 heavy melting	31.00-32.00
No. 1 dealer bundles	40.00-41.00
No. 2 bundles	25.00-26.00
No. 1 busheling	40.00-41.00
No. 1 factory bundles	*48.00-49.00*
Machine shop turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Short shovel turnings	26.00-27.00
Cast iron borings	26.00-27.00
Cut structurals:	
2 ft and under	47.00-48.00
3 ft and under	46.00-47.00
Heavy turnings	30.00-31.00
Punchings & plat scrap	49.00-50.00
Electric furnace bundles	47.00-48.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	45.00-46.00
Unstripped motor blocks	32.00-33.00
Clean auto cast	46.00-47.00
Drop broken machinery	52.00-53.00

Railroad Scrap

No. 1 R.R. heavy melt.	44.00-45.00
Rails 2 ft and under	57.00-58.00
Rails 18 in. and under	57.00-58.00
Random rails	52.00-53.00
Angles splice bars	50.00-51.00
Railroad specialties	51.00-52.00
Rails rerolling	61.00-62.00

Stainless Steel Scrap

18-8 bundles & solids	230.00-235.00
18-8 turnings	115.00-120.00
430 bundles & solids	120.00-125.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	*36.00-37.00*
No. 1 hvy melt., dealer	*35.00-36.00*
No. 2 hvy melting	*33.00-34.00*
No. 1 factory bundles	*40.00-41.00*
No. 1 dealer bundles	*36.00-37.00*
No. 2 bundles	24.00-25.00
No. 1 busheling, indus.	*36.00-37.00*
No. 1 busheling, dealer	*35.00-36.00*
Machine shop turnings	*18.00-19.00*
Mixed borings, turnings	*20.00-21.00*
Short shovel turnings	*20.00-21.00*
Cast iron borings	*20.00-21.00*
Cut structurals, 3 ft.	45.00-46.00
Punchings & plate scrap	46.00-47.00

Cast Iron Grades

No. 1 cupola	52.00-53.00
Stove plate	49.00-50.00
Unstripped motor blocks	43.00-44.00
Clean auto cast	58.00-59.00
Drop broken machinery	58.00-59.00

Railroad Scrap

No. 1 R.R. heavy melt.	39.00-40.00
R.R. malleable	59.00-60.00
Rails, 2 ft and under	55.00-56.00
Rails 18 in. and under	56.00-57.00
Angles, splice bars	48.00-49.00
Axles	59.00-60.00
Rails, rerolling	59.00-60.00

Stainless Steel Scrap

18-8 bundles & solids	215.00-220.00
18-8 turnings	115.00-120.00
430 bundles & solids	115.00-120.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	*41.00-42.00*
No. 2 heavy melting	*30.00-31.00*
No. 1 busheling	*41.00-42.00*
No. 1 bundles	*42.00-43.00*
No. 2 bundles	25.00-26.00
Machine shop turnings	17.00-18.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Low phos.	*44.00-45.00*
Electric furnace bundles	*44.00-45.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*43.00-44.00*

CLEVELAND

No. 1 heavy melting	*38.00-39.00*
No. 2 heavy melting	*27.00-28.00*
No. 1 factory bundles	*43.00-44.00*
No. 1 bundles	*38.00-39.00*
No. 2 bundles	25.00-26.00
No. 1 busheling	*38.00-39.00*
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	*40.00-41.00*
Cut structurals, plates 2 ft and under	*46.00-47.00*
Low phos. punchings & plate	39.00-40.00
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	39.00-40.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Charging box cast	38.00-39.00
Heavy breakable cast	38.00-39.00
Stove plate	41.00-45.00
Unstripped motor blocks	*36.00-37.00*
Brake shoes	36.00-37.00
Clean auto cast	*52.00-53.00*
Burnt cast	37.00-38.00
Drop broken machinery	*52.00-53.00*

Railroad Scrap

R.R. malleable	65.00-66.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cast steel	46.00-47.00
Railroad specialties	48.00-49.00
Uncut tires	42.00-43.00
Angles, splice bars	51.00-52.00
Rails, rerolling	58.00-59.00

Stainless Steel
(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	215.00-220.00
18-8 turnings	110.00-115.00
430 clips, bundles, solids	125.00-130.00
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	33.00
No. 2 heavy melting	31.00
No. 1 bundles	37.00
No. 2 bundles	21.00
No. 1 busheling	37.00
Machine shop turnings	14.00
Short shovel turnings	16.00

Cast Iron Grades

No. 1 cupola	*51.00*
Charging box cast	42.00
Heavy breakable cast	40.00
Unstripped motor blocks	41.00
Clean auto cast	54.00
Stove Plate	*46.50*

Railroad Scrap

No. 1 R.R. heavy melt	*39.00*
Rails, 18 in. and under	*50.00*
Rails, random lengths	*43.00*
Rails, rerolling	*56.00*
Angles, splice bars	45.00

BIRMINGHAM

No. 1 heavy melting	32.50-33.50
No. 2 heavy melting	25.00-26.00
No. 1 bundles	36.00-37.00
No. 2 bundles	22.00-23.00
No. 1 busheling	36.00-37.00
Cast iron borings	14.00-15.00
Machine shop turnings	22.00-23.00
Short shovel turnings	26.00-27.00
Bar crops and plates	42.00-43.00
Structurals & plates	41.00-42.00
Electric furnace bundles	36.00-37.00
Electric furnace:	
3 ft and under	34.00-35.00
2 ft and under	35.00-36.00

Cast Iron Grades

No. 1 cupola	*55.00-56.00*
Stove plate	*55.00-56.00*
Charging box cast	29.00-30.00
Unstripped motor blocks	*42.00-43.00*
No. 1 wheels	*41.00-42.00*

Railroad Scrap

No. 1 R.R. heavy melt.	34.00-35.00
Rails, 18 in. and under	48.00-49.00
Rails, rerolling	54.00-55.00
Rails, random lengths	40.00-41.00
Angles, splice bars	43.00-44.00

PHILADELPHIA

No. 1 heavy melting	38.00
No. 2 heavy melting	32.00
No. 1 bundles	39.00
No. 2 bundles	*28.00*
No. 1 busheling	39.00
Electric furnace bundles	*40.00*
Mixed borings, turnings	20.00†
Short shovel turnings	24.00-25.00
Machine shop turnings	20.00
Heavy turnings	33.00-34.00
Structurals & plate	40.00-42.00
Couplers, springs, wheels	44.00
Rail crops, 2 ft & under	58.00-60.00

Cast Iron Grades

No. 1 cupola	41.00
Heavy brakable cast	*43.00*
Drop broken machinery	49.00-50.00
Malleable	67.00-68.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	28.00-29.00
No. 2 bundles	17.00-18.00
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	12.00-13.00
Short shovel turnings	13.00-14.00
Low phos. (structurals & plates	36.00-37.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	25.00-26.00
Heavy breakable	34.00-35.00

Stainless Steel

18-8 sheets, clips, solids	195.00-200.00
18-8 borings, turnings	85.00-90 00
410 sheets, clips, solids	55 00-60.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	33.00-34.00
No. 2 bundles	23.00-24.00
No. 1 busheling	33.00-34.00
Short shovel turnings	21.00-22.00
Machine shop turnings	17.00-18.00
Cast iron borings	19.00-20.00
Low phos structurals and plate, 2 ft and under	43.00-44.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	42.00-43.00
No. 1 machinery	46.00-47.00

Railroad Scrap

Rails, random lengths	45.00-46.00
Rails, 3 ft and under	51.00-52.00
Railroad specialties	43.00-44.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*35.50-36.50*
No. 2 heavy melting	*30.50-31.50*
No. 1 bundles	*35.50-36.50*
No. 2 bundles	*25.00-26.00*
No. 1 busheling	*35.50-36.50*
Machine shop turnings	*19.00-20.00*
Mixed borings, turnings	*19.00-20.00*
Short shovel turnings	*21.00-22.00*
Cast iron borings	*20.00-21.00*
Low phos., 18 in.	*45.00-46.00*

Cast Iron Grades

No. 1 cupola	*46.00-47.00*
Heavy breakable cast	*42.00-43.00*
Charging box cast	39.00-40.00
Drop broken machinery	*52.00-53.00*

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00
Rails, 18 in. and under	55.00-56.00
Rails, random lengths	47.00-48.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	34.00†
No. 2 heavy melting	31.00†
No. 1 bundles	34.00†
No. 2 bundles	21.00†
Machine shop turnings	17.00†
Short shovel turnings	20.00†
Low phos. plate & structurals	*42.00*

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable	27.00-28.00†
Foundry malleable	41.00-42.00
Unstripped motor blocks	38.00-38.50

Railroad Scrap

No. 1 R.R. heavy melt.	34.00†

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	20.00-20.50
No. 1 bundles	26.00-27.00
No. 1 busheling	26.00-27.00
Machine shop turnings	10.00-11.00
Short shovel turnings	12.00-13.00
No. 1 cast	33.00
Mixed cupola cast	33.00
No. 1 machinery cast	34.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*31.00-32.00*
No. 2 heavy melting	*21.00-22.00*
No. 1 bundles	*32.00-33.00*
No. 2 bundles	*20.50-21.50*
No. 1 busheling	*31.00-32.00*
Machine shop turnings	12.00-13.00
Mixed borings, turnings	13.00-14.00
Short shovel turnings	*14.00-15.00*

Cast Iron Grades

No. 1 cupola	*47.00-48.00*
Stove plate	*37.00-38.00*
Charging box cast	*38.00-39.00*
Heavy breakable	*38.00-39.00*
Unstripped motor blocks	*26.00-27.00*
Clean auto cast	*52.00-53.00*

SEATTLE

No. 1 heavy melting	35 00†
No. 2 heavy melting	33.00†
No. 1 bundles	27.00†
No. 2 bundles	22.00†
Machine shop turnings	17.00†
Mixed borings, turnings	17.00†
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	34.00†
Heavy breakable cast	28.00†
Unstripped motor blocks	26.00†
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	38.00
No. 2 heavy melting	36.00
No. 1 bundles	35.00
No. 2 bundles	18.00
Machine shop turnings	17.00
Shoveling turnings	19.00
Cast iron borings	19.00
Cut structurals and plate 1 ft and under	49.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	47.00

Railroad Scrap

No. 1 R.R. heavy melt.	41.00

SAN FRANCISCO

No. 1 heavy melting	36.00
No. 2 heavy melting	33.00
No. 1 bundles	33.00
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	42.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

(Brokers' buying prices)

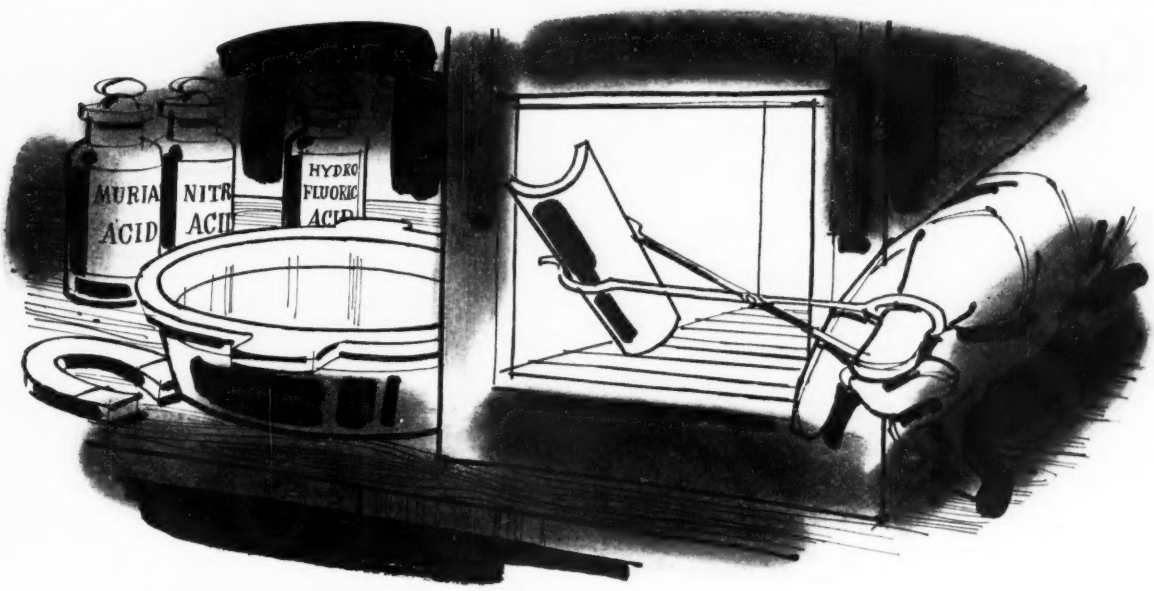
No. 1 heavy melting	32.25
No. 2 heavy melting	28.25
No. 1 bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Mixed borings, turnings	13.00
Busheling, new factory:	
Prepared	32.25
Unprepared	26.25
Short steel turnings	17.00

Cast Iron Grades‡

No. 1 machinery cast	46.50-48.00

†Nominal.
‡F.o.b. Hamilton, Ont.

S-E-G-R-E-G-A-T-E-D SCRAP IS WORTH MORE



Here is how to test for

STAINLESS STEEL TYPES 321 and 347

These two stainless steel types are recommended for parts which are fabricated by welding and cannot be subsequently heat treated. They are also used for parts which are subject to severe corrosive conditions or in situations where they may undergo a temperature range of 800 to 1650 deg. F.

Type 321 is a basic 18-8 analysis containing titanium and is used in aircraft and missile parts.

Type 347 is a basic 18-8 analysis which contains columbium and tantalum. This type is important for use in welded storage tanks containing organic chemicals, jet engine parts and heat resistors. It also finds an important place in the petroleum industry where it is used in distilling and fractionating columns.

For scrap of known analysis, our personnel, equipment and strategically located facilities are specifically geared for the purchase or sale of dependably segregated metals. We welcome your inquiry.

PROCEDURE

Rub specimen with emery paper to obtain clean surface. Add 1 drop of 1:1 nitric acid. If there is no attack, the material is Stainless Steel. Test sample with magnet. If it is definitely non-magnetic, the specimen is one of the 18-8 steels. Place specimen in a solution of muriatic acid (1 part water, 1 part muriatic acid) at a temperature of 180/190 deg. F. After 5 minutes, Types 302, 304, 305, 316, 317, 321 and 347 will be white. Then, place specimen in fresh solution of muriatic acid at temperature of 180/190 deg. F. Within 2 minutes there will be active attack and gas evolution on Types 302, 304, 321 and 347. To separate 321 and 347 from 302 and 304, a stabilization test is necessary. Heat specimens to 1250 deg. F. for 2 hours and then cool to room temperature in air. Then place specimens in cold solution of 3 parts nitric acid, 1 part hydrofluoric acid, and 6 parts water. Leave for 1 hour. Remove specimens from solution and wash with water. Stainless Types 321 and 347 will show very slight attack on their surface.

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Copper Hit by Clayton Act

Antitrust action against Kennecott could have far-reaching effects on the industry. It's much more than just a move against a single producer

Nonferrous Metal Prices, Pages 136 & 137

ALTHOUGH YOU'LL hear little about it in copper circles, the government's antitrust suit against Kennecott Copper Corp. is causing concern among leading producers.

Uncle Sam's legal sleuths at the Department of Justice claim that Kennecott's acquisition of the Okonite Co. (a copper wire and cablemaker) last November was illegal. They charge violation of Section 7 of the Clayton Act which prohibits mergers or acquisitions whose effect "may be substantially to lessen competition or tend to create a monopoly."

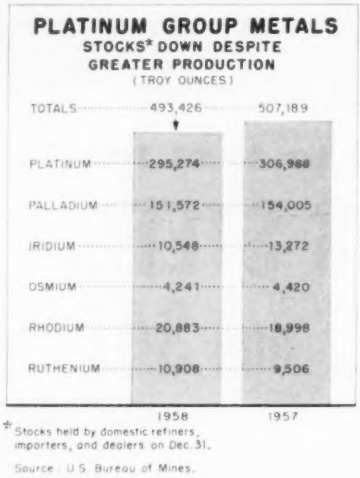
• **Significance**—The importance of this case goes beyond an action against a single producer. If you follow the government's reasoning, it's conceivable that a similar action could have been brought against any of the four or five leading companies.

Here's why: The government charges that three companies produced over 70 per cent of the domestic copper ore in 1957, that 90 per cent of the smelting capacity is controlled by four firms, and that the same four control over 87 per cent of the electrolytic capacity and over 90 per cent of the fire refined capacity.

Says Atty. Gen. William P. Rogers: "The suit alleges that concentration in copper production has resulted in large part from mergers and acquisitions by all the leading copper companies and that the integration by the major producers into copper fabrication has been achieved almost entirely by acquisition. . . Moreover, the copper industry has exhibited a growing trend toward the absorption of fabricating companies by producers."

• **Biggest First?**—Kennecott was probably singled out because it's the largest producer and because the Okonite acquisition gave the government a convenient entree. Insiders say Justice lawyers were studying copper closely prior to that move.

Sources close to Washington say Justice believes the copper industry is buying up its customers as companies seek a guaranteed market for their metal. In the opinion of Justice this tends to put the producers in competition with their own customers and lessens over-all competition.



Some observers say the action proves that Justice believes "it's a sin to be big." Certainly the Okonite acquisition doesn't make Kennecott a dominant force in the wire and cable field. It had only a fair sized wire and cable business before, and Okonite isn't one of the industry giants ($40 million sales in 1957).

• **What Next?**—Kennecott has to answer the government's charges around the middle of July (unless an extension is granted). It's a sure bet it will deny them since the company has gone on record as saying it's confident it has not violated the law.

Then there will be the usual pretrial hearings where one of two things could happen: 1. The government could drop its charges. 2. Kennecott could agree to divest itself of its Okonite holdings and agree not to acquire any more copper fabricators.

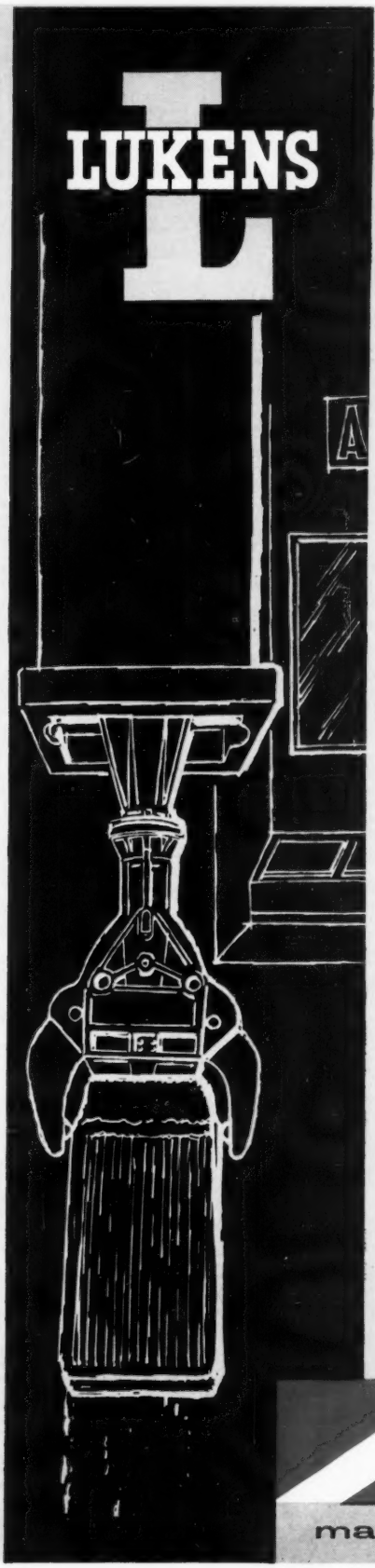
If neither of these unlikely events occurs, the case will undoubtedly go to trial.

Whatever the outcome of the Kennecott case, it has caused many a man in the nonferrous field to ask himself these questions: 1. Will other actions be brought demanding divestment of acquisitions? 2. What about future mergers and acquisitions? 3. Will attempts be made to limit future growth? 4. How about the post-World War II trend of heavy stock ownership by one company in another metals company? 5. Will firms in other metal fields be slapped with similar actions? (Justice says there are no more suits pending but that it is closely studying the whole metals field.)

NONFERROUS PRICE RECORD

	July 1 Price	Last Change	Previous Price	June Avg	May Avg	July, 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	24.000
Copper	30.00-31.50	June 29, 1959	30.50-31.50	31.490	31.750	26.125
Lead	11.80	May 7, 1959	11.30	11.800	11.700	10.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	103.125	July 1, 1959	103.375	104.284	103.080	94.950
Zinc	11.00	Feb. 25, 1959	11.50	11.000	11.000	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig 99.8%, Velasco, Tex.



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For highest efficiency and greatest strength in Operation, Lukens Steel Company looks to THE ALLIANCE MACHINE COMPANY.

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Main Office:
Alliance,
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Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.30 per lb deld.

Cobalt: 97.99%, $1.75 per lb for 500-lb keg, $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 31.50 deld.; custom smelters, 30.00; lake, 31.50 deld.; fire refined, 31.25 deld.

Germanium: First reduction, less than 1 kg, 38.30 per gram; 1-10 kg, 33.30 per gram; 10 kg or more, 31.30 per gram; intrinsic grade, 33.30-35.30 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 nom. per troy oz.

Lead: Common, 11.80; chemical, 11.90; corroding, 11.90, St. Louis. New York basis, add 0.20.

Lithium: 1 lb or 2 lb ingots, less than 50 lb, $11 per lb, f.o.b. Minneapolis; 50-99 lb, $10; 100-499 lb, $9.50; 500 lb or more, $9 per lb, delivered.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $239-241 per 75 lb flask.

Molybdenum: Unalloyed forging billets, 4.125-7.0 in. diam., $9.85 per lb in lots of 2500 lb or more, f.o.b. Coldwater, Mich.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. ports of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $18-20 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $122-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Melting stock, $35 per lb; rod, $60 per lb nom.; sheet, $55 per lb nom.

Tellurium: $2.00-2.20 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 103.125.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime western, 11.00; brass special, 11.25; intermediate, 11.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 12.00; special high grade, 12.25 deld. Diecasting alloy ingot No. 3, 14.00; No. 2, 14.50; No. 5, 14.25 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 26.00-27.75; No. 12 foundry alloy (No. 2 grade), 23.75-24.00; 5% silicon alloy, 0.60 Cu max., 25.00; 13 alloy, 0.60 Cu max., 25.00; 195 alloy, 26.75-27.00; 198 alloy, 24.25-24.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 24.50; grade 2, 23.25; grade 3, 22.25; grade 4, 21.50.

Brass Ingot: Red brass No. 115, 30.25; tin bronze, No. 225, 41.25; No. 245, 35.00; high-leaded tin bronze, No. 305, 34.50; No. 1 yellow, No. 405, 24.75; manganese bronze, No. 421, 27.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.89, f.o.b. Temple, Pa.

COPPER WIRE

Bars, soft, f.o.b. eastern mills, 20,000-lb lots, 36.855; l.c.l., 37.48. Weatherproof, 20,000-lb lots, 37.42; l.c.l., 38.17.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $17.50 per cwt; pipe, full coils, $17.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.25-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

(Prices per lb, c.l., f.o.b. mill) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	138	120	138
Strip, C.R.	124	108	138
Plate, H.R.	130	110	126
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003 and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	.....
0.136-0.096	43.20-48.30	.....
0.126-0.103	.....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	.....
0.077-0.061	.....	39.50-40.70
0.068-0.061	44.30-52.20	.....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-11.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.00	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam., 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ¾ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

	Alloy 6063-T5	Alloy 6062-T6
Factor		
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	65.30-67.60	84.60-87.40
12-14	65.30-67.60	85.70-88.00
24-26	66.10-75.30	90.60-91.30
36-38	66.10-75.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 22.50-23.00; No. 2 heavy copper and wire, 20.50-21.00; light copper, 18.50-19.00; No. 1 composition red brass, 17.25-17.75; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 31.50c)		
	Sheets, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	55.63b	52.86c	....	55.82	27.500	27.500	26.750
Yellow Brass	48.24	32.73d	48.78	51.65	20.625	19.750	18.750
Low Brass, 80%	51.23	51.17	51.77	54.54	23.250	23.000	22.500
Red Brass, 85%	52.29	52.23	52.83	55.60	24.250	24.000	23.500
Com. Bronze, 90%	53.90	53.84	54.44	56.96	25.125	24.875	24.375
Manganese Bronze	56.54	50.14	60.62	....	19.125	18.875	18.375
Muntz Metal	50.85	46.16	....	....	19.375	19.125	18.625
Naval Brass	52.80	46.61	59.36	56.21	19.125	18.875	18.375
Silicon Bronze	60.67	59.86	60.21	78.35	27.000	26.750	26.000
Nickel Silver, 10%	63.82	66.15	66.15	....	25.500	25.250	12.625
Phos. Bronze	75.34	75.84	75.84	77.02	28.625	28.375	25.750

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 15.75-16.25; new brass clippings, 15.00-15.50; light brass, 11.00-11.25; heavy yellow brass, 12.00-12.25; new brass rod ends, 12.50-13.00; auto radiators, unsweated, 13.50-14.00; cocks and faucets, 14.00-14.50; brass pipe, 14.00-14.50.

Lead: Soft scrap lead, 7.75-8.25; battery plates, 2.50-3.00; linotype and stereotype, 9.25-9.75; electrotype, 7.75-8.25; mixed babbitt, 9.75-10.25.

Monel: Clippings, 30.00-32.00; old sheets, 26.00-28.00; turnings, 20.00-22.00; rods, 30.-00-32.00.

Nickel: Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 39.00-40.00; rod ends, 52.00-54.00.

Zinc: Old zinc, 3.25-3.50; new diecast scrap, 3.00-3.25; old diecast scrap, 1.75-2.00.

Aluminum: Old castings and sheets, 11.50-11.75; clean borings and turnings, 7.25-7.75; segregated low copper clips, 14.75-15.25; segregated high copper clips, 14.25-14.75; mixed low copper clips, 15.00-15.50; mixed high copper clips, 12.25-12.75.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 12.25-12.75; clean borings and turnings, 10.00-10.50; segregated low copper clips, 17.25-17.75; segregated high copper clips, 16.25-16.75; mixed low copper clips, 16.50-17.00; mixed high copper clips, 15.75-16.25.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 11.50-11.75; clean borings and turnings, 10.50-11.00; segregated low copper clips, 15.75-16.25; segregated high copper clips, 14.75-15.25; mixed low copper clips, 15.25-15.75; mixed high copper clips, 14.25-14.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)
Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 57.50; light scrap, 52.50; turnings and borings, 37.50.

Copper and Brass: No. 1 heavy copper and wire, 26.00; No. 2 heavy copper and wire, 24.00; light copper, 21.75; refinery brass (60% copper) dry copper content, 23.50.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 26.00; No. 2 heavy copper and wire, 24.00; light copper, 21.75; No. 1 composition borings, 20.50; No. 1 composition solids, 21.00; heavy yellow brass solids, 15.00; yellow brass turnings, 14.00; radiators, 16.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.30.

Copper: Flat-rolled, 47.79; oval, 46.00, 5000-10,000 lb; electrodeposited, 39.50, 2000-5000 lb lots; cast, 42.00, 5000-10,000 lb quantites.

Nickel: Depolarized, less than 100 lb, 114.25; wire, 27.00; No. 2 heavy copper and wire, 26.00, light copper, 23.75; refinery brass deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 121.50; 200-499 lb, 120.00; 500-999 lb, 119.50; 1000 lb or more, 119.00.

Zinc: Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.30 per lb in 100-lb drums.
Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,-000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 15.30; 2000-5900 lb, 13.30; 6000-11,900 lb, 13.05; 12,000-22,900 lb, 12.80; 23,000 lb or more, 12.30.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

Sodium Stannate: Less than 100 lb, 80.10; 100-600 lb, 70.70; 700-1900 lb, 68.00; 2000-9900 lb, 66.10; 10,000 lb or more, 64.80.

Stannous Chloride (Anhydrous): 25 lb, 155.60; 100 lb, 150.70; 400 lb, 148.30; 800-19,900 lb, 107.40; 20,000 lb or more, 101.30.

Stannous Sulphate: Less than 50 lb, 140.70; 50 lb, 110.70; 100-1900 lb, 108.70; 2000 lb or more, 106.70.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page* 131)

Prices are unchanged and are not expected to weaken unless the mills are shut down for a long period.

• **Cincinnati** — Area mills entered the market last week, sending prices up $2 a ton in brokers' lists. The increase applied to all grades except cast and railroad. A fairly vigorous buying program is being followed by the mills. Some shipments of secondary grades may be shut off at midmonth.

• **St. Louis** — Extension of steel wage negotiations has served to keep scrap prices steady. Little trading to test quotations is reported. Minor advances are noted in the cast iron grades, reflecting a lessening in supplies. Also the railroad grades are a little stronger, due to limited offerings by the roads.

• **Birmingham**—A surge of orders for scarce cast scrap sent up prices on those grades $1 to $2 a ton. Some dealers are about scraping the bottom of their stockpiles. Some foundry grades of steel scrap are moving, but deliveries of open hearth scrap have been completed. Electric furnaces, largely, have their needs filled for the immediate future.

• **Houston**—Brokers are out of the market for scrap, and quotations are largely nominal. Over-the-scale traffic is slow. In border areas, old Mexican orders are being covered with difficulty because of the scarcity of country material. Western Gulf export buying is spotty. One cargo is scheduled for loading here, starting July 10.

• **Los Angeles**—Exports offer the only current outlet for scrap. Domestic mills are not buying, and the dealers are taking in material slowly. Yard inventories are rising.

o **Seattle** — Sales continue to be limited, and prices are nominal in the absence of a representative buying test. Foreign buyers are marking time, closely watching for developments in the domestic market situation. They are not placing any

IMMEDIATELY AVAILABLE

Because of Mill Consolidation
3 LEE WILSON RECTANGULAR, BELL-TYPE ANNEALING FURNACES, atmosphere controlled with 9 bases, are available. Each is approximately 7' x 7' x 14'. Excellent when used for manufacture of steel coils, they have a capacity of 50 tons per charge. These top-grade furnaces are still set up in the plant. Tremendous values specially priced for prompt sale.

NATIONAL MACHINERY EXCHANGE
126 Mott St. New York 13, N. Y.
CAnal 6-2470

IF YOU OPERATE A FURNACE . . . . .
We will purchase your scrap linings, retorts, conveyors, muffles, racks, etc. Any item made of Nickle alloy.
Write, Wire or Call
Weinstein Co.,
610 W. 8th St.
Jamestown, N. Y.
Phone 61-154

FOR SALE LESS THAN MILL PRICE
NEW PLATE
90 tons 5/16 x 18 x 72 nickel chrome moly SAE 8630 annealed, P. & O. on skids.
BARKSDALE MFG. CO.
Blytheville, Ark.

GET CASH NOW
for your new surplus motors, controls and transformers!
AVAILABLE: NEW MOTORS
Over 5,000 new motors in stock, from ¼HP to 200 HP. Special low prices.

Write, wire or phone collect!
AJAX ELECTRIC MOTOR CORP.
P.O. Box 262, Rochester, N.Y.
Long Distance Phone LD. 133

METAL PRODUCTS DIVISION MANAGER

To take complete responsibility for product development, direction of work, time and cost control, methods and procedures, equipment lay-out and product flow, estimating, purchasing, engineering, personnel utilization. Salary related to ability, plus earnings participation.

Location—Southeastern Pa. Write in confidence to

Box 775, STEEL
Penton Bldg. Cleveland 13, Ohio

CLASSIFIED RATES

All classifications other than "Positions Wanted" set solid, 50 words or less $15.00, each additional word .30, all capitals, 50 words or less $19.20, each additional word .38; all capitals leaded, 50 words or less $23.40, each additional word .47. "Positions Wanted" set solid, 25 words or less $3.60, each additional word .14, all capitals, 25 words or less $4.50, each additional word .18; all capitals leaded, 25 words or less $5.40, each additional word .22. Keyed address takes seven words. Cash with order necessary on "Positions Wanted" advertisements. Replies forwarded without charge. Displayed classified rates on request. Address your copy and instructions to STEEL, Penton Building, Cleveland 13, Ohio.

Specify the

T-J Spacemaker

for longer, more efficient cylinder service

You too—can reduce replacement expenditures—lower maintenance costs with the T-J Spacemaker cylinder line. Designed and engineered for ruggedness, and accuracy of operation, the Spacemaker assures longer, uninterrupted operation.

The T-J Spacemaker eliminates tie-rods, gives greater strength, saves space . . . and reduces costs in all push-pull operations. Immediate delivery in a complete range of styles and capacities . . . air or oil. Write for Bulletin SM 155-4, today. The Tomkins-Johnson Company, Jackson, Michigan.

WITH EXTRAS . . . AT NO EXTRA COST

1. METAL PISTON ROD SCRAPER—protects rod packing, cylinder bore and rod surface by removing all foreign particles.
2. NEW "SUPER" CUSHION for air or METALLIC SELF-ALIGNING MASTER CUSHION for oil.
3. HARD CHROME PLATED CYLINDER BORES AND PISTON RODS for greater protection and reduced wear.
4. ONE PIECE PISTON assures better alignment, longer bearing and packing life.
5. FORGED SOLID STEEL HEADS throughout entire line.
6. PILOTED PACKING GLAND with extra long bearing for additional strength and support to piston rod.
7. NO TIE-RODS TO STRETCH—gives you 360° port rotation . . . less space used . . . full strength.
8. STREAMLINED DESIGN . . . operating pressures to 200 PSI, air; 1,000 PSI oil, non-shock.

T-J TOMKINS-JOHNSON
RIVETORS . . . AIR AND HYDRAULIC CYLINDERS . . . CUTTERS . . . CLINCHORS

sizable new business at present.

House Votes to Extend Suspension of Scrap Duty

The House Ways & Means Committee last week approved a bill to continue through June, 1960, the suspension of import duties on most types of metal scrap. Affected would be imports of such material as iron and steel, aluminum, magnesium, nickel, and nickel alloy scrap. The bill must be acted upon by the Senate.

Scrap Trade Problems Probed by Senate Group

Public hearings on technological and competitive problems in the scrap industry were started June 24 by the Monopoly Subcommittee of the Senate Small Business Committee. Sen. Russell B. Long (Dem. La.) is chairman. The committee will look into problems created by major technological and economic changes in the industry and investigate complaints of independent scrap dealers that they are being squeezed out of markets.

Plans Diecasting Plant

Chrysler Corp. of Canada Ltd., Windsor, Ont., will build an aluminum diecasting plant in that city. Aluminum ingots for the plant will be supplied by Chryslum Ltd., a new company being formed by Chrysler (as majority owner) and Aluminum Co. of Canada, Montreal, Que. Chrysler will start production of oil pump and water pump components and clutch housings during the 1960 model production.

Howard May Close Down

Howard Foundry Co., Chicago, may have to close its investment casting plant at 5100 N. 33rd St., Milwaukee, Wis., this year because of a decline in government purchasing. Many of the castings are used in military jet engines. "With the emphasis changing from aircraft to missiles, there has been a decrease in orders," the company says. The plant was purchased from Allis-Chalmers Mfg. Co. in 1952.

Advertising Index

Abell-Howe Co. 114
Abrasive Shot & Grit Co., Inc. 127
Aetna Life Insurance Co. 22
Ajax Electric Motor Corporation 137
Allegheny Ludlum Steel Corporation 140
Alliance Machine Co., The 135
Allied Research Products, Inc. 28
American Hoist & Derrick Co. 85
American Roller Die Corporation 112
Armco Steel Corporation 36
Atlas Car & Mfg. Co. 10

Baldwin-Lima-Hamilton Corporation, Standard Steel Works Division 12
Barksdale Mfg. Co. 137
Basic, Inc. 30
Behr-Manning Co., Division of Norton Co. .. 86
Bethlehem Steel Co. 1
Bliss, E. W., Co., Mackintosh-Hemphill Division 11
Bullard Co., The 56

Carpenter Steel Co., The 99
Cattie, Joseph P., & Brothers, Inc. 130
Cement Gun Co. 102
Cleveland Metal Abrasive Co., The 110
Cleveland Tramrail Division, The Cleveland Crane & Engineering Co. 108
Colorado Fuel & Iron Corporation, The 29
Copper & Brass Research Association 18, 19
Crucible Steel Casting Co. 129
Crucible Steel Company of America 107
Cutler-Hammer, Inc. ..... Back Cover

De Laval Steam Turbine Co. 52, 53
Detrex Chemical Industries, Inc. 70
Diversey Corporation, The 91
DoAll Co., The 127, 129, 130, 131
Duraloy Co., The 103
Dynapak Convair, A Division of General Dynamics Corporation 69

Eaton Manufacturing Co., Reliance Division .. 73
Electric Controller & Mfg. Co., The, A Division of The Square D Co. ..... Inside Front Cover
Ex-Cell-O Corporation 6
Ex-Cell-O Corporation, Machinery Division .. 7

Fairbanks, Morse & Co. 106
Farquhar, A. B., Division, The Oliver Corporation 62
Federal Machine & Welder Co., The 74
Foster, L. B., Co. 16
Frasse, Peter A., & Co., Inc. 50

Garlock Packing Co., The 25
General Dynamics Corporation, Dynapak Convair Division 69
Globe Brick Co., The 113

Handy & Harman 101
Harrington & King Perforating Co., Inc., The 102
Hayes, C. I., Inc. 63
Hevi-Duty Electric Co. 100
Houghton, E. F., & Co. 13
Hyde Park Foundry & Machine Co. 139

Inland Steel Co. 35

Kaiser Aluminum & Chemical Sales, Inc., Mexico Refractories Division 14, 15
Kidde, Walter, & Co., Inc. 94

Landis Machine Co. 17
Logan Co. 105
Luria Brothers & Co., Inc. 133

McKee, Arthur G., & Co. 83

Mackintosh-Hemphill Division of E. W. Bliss Co. 11
Mahon, R. C., Co., The 24
Marchant, Geo. F., Co. 104
Mexico Refractories Co., Division of Kaiser Aluminum & Chemical Sales, Inc. 14, 15
Morgan Construction Co. 49

National Forge Co. 3
National Steel Corporation 67
Nicholson File Co. 23
Norton Co., Behr-Manning Co. Division 86

Oliver Corporation, The, A. B. Farquhar Division 62

Pacific Industrial Manufacturing Co. 89
Pangborn Corporation ..... Inside Back Cover

Reliance Division, Eaton Manufacturing Co. .. 73
Republic Steel Corporation 8, 9
Roebling's, John A., Sons Corporation, A Subsidiary of The Colorado Fuel & Iron Corporation 29
Ryerson, Joseph T., & Son, Inc. 38

St. Joseph Lead Co. 97
SKF Industries, Inc. 2
Square D Co., The, The Electric Controller & Mfg. Co. Division ..... Inside Front Cover
Standard Pressed Steel Co., Unbrako Socket Screw Division 26
Standard Steel Works Division, Baldwin-Lima-Hamilton Corporation 12
Sterling National Industries, Inc. 115

Texaco, Inc. 21
Thomas Machine Manufacturing Co. 115
Timken Roller Bearing Co., The, Steel & Tube Division 60
Tinnerman Products, Inc. 64
Tomkins-Johnson Co., The 138

Ulbrich Stainless Steels 117

Veeder-Root, Inc. 4

Wales Strippit, Inc. 20
Ward Steel Co. 16
Washington Steel Corporation 116
Wean Equipment Corporation 59
Weirton Steel Co. 67
Westinghouse Electric Corporation 27
Wheland Co., The 62

~ ~ ~

Table of Contents

Facing Inside Front Cover

Classified Advertising, Page 137

RED CIRCLE
Rolls
ALLOY-CHILLED
Hyde Park
RAMS
for all types of
HYDRAULIC
EQUIPMENT
Hyde Park Rams are available in Chilled or Alloy Iron.
Furnished in hardness range to meet your specification . . . ground to your required size.
On your next replacement of Rams—or for new equipment—consult us. Our engineers will be glad to assist you.
Red Circle Rolls for every Purpose
Rolling Mill Equipment
Gray Iron Castings up to 80,000 lb.

***Experience**—the added alloy in **Allegheny Ludlum** tool steels*

Careful addition of sulfur to melt guarantees typical sulfide distribution, as shown in photomicrograph of longitudinal specimen of EZ MACHINING tool steel.

Sulfur addition to melt held to narrow range in Allegheny Ludlum's EZ MACHINING GRADES

Uniform, finely-distributed sulfides mean uniform machining, uniform high finish, uniform long tool life order after order

Adding sulfur, actually an impurity, to a tool steel melt to make it free-machining must be done with care and precision. That's why Allegheny Ludlum maintains an extremely close average range in adding sulfur to its EZ MACHINING grades. But mere range, however narrow, is not enough. A-L has developed special techniques in adding sulfur and nucleating agents to produce the uniform, finely-distributed sulfides that characterize good free-machining tool steels.

A-L's extra care means you can standardize your machining operations from piece to piece and order to order. This reproducibility is reflected in uniform *machining;* uniform *high finish;* uniform *long tool life.*

For example, in the production of hobs these machining properties in Allegheny Ludlum's EZ MACHINING steels minimize the costly "backing off" operation for back clearance of multiple teeth, eliminating complicated extra heat treatment. Lower residual stresses are set up, because the steel has a lower resistance to the cutting action. Naturally, hobbing is only one of the situations where these free-machining characteristics can benefit you.

Allegheny Ludlum stocks a complete line of tool steel sizes and grades. Call your nearest A-L representative; you'll get quick service and counsel on such problems as heat treating, machining, grade selection, etc. Or write for A-L's publication list which gives full data on the more than 125 technical publications offered. They'll make your job easier.

ALLEGHENY LUDLUM STEEL CORPORATION, Oliver Building, Pittsburgh 22, Pa. Address Dept. S-19.

WSW-7259

ALLEGHENY LUDLUM

Tool Steel warehouse stocks throughout the country... Check the yellow pages

every grade of tool steel... every help in using it

Now Get Castings as Clean as This...and Save Money

Rotoblast cuts cleaning costs to the bone—adds new dollars to your profits

The casting above was Rotoblast cleaned at new low cost made possible by Rotoblast Steel Shot. Although cleaning cost per casting may seem a small part of your overall production cost, its efficiency often spells the difference between big and small profits on the finished job. Rotoblast assures you *maximum profit.*

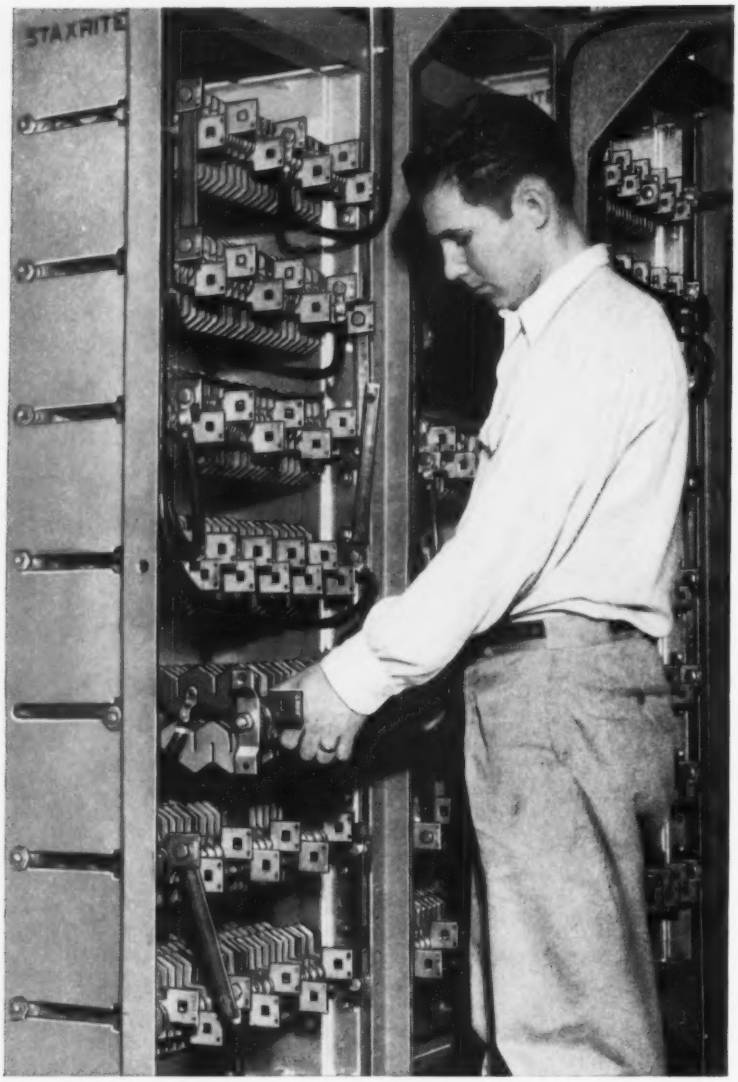
Why? Because Rotoblast shot starts as a better-made steel, low in phosphorus and sulphur, produced in modern electric furnances. Because Rotoblast shot uses an exclusive casting method to produce solid shot. Because Rotoblast is continuous-heat treated in a controlled atmosphere—another exclusive—to give you uniformity and the right hardness for fast cleaning *and* long wear.

Prove Rotoblast's cost-cutting qualities in *your* plant. To arrange a test, talk to your Pangborn man or write PANGBORN CORPORATION, 1600 Pangborn Blvd., Hagerstown, Maryland. *Manufacturers of Blast Cleaning and Dust Control Equipment—Rotoblast® Steel Shot and Grit.*

Pangborn

ROTOBLAST
STEEL SHOT AND GRIT

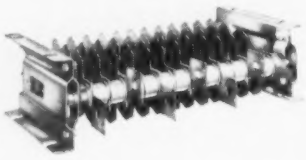
Complete non-breakable resistor banks . . . factory assembled, wired and ready to go



Here is the very latest word in Mill Duty resistors . . . Cutler-Hammer's "draw-out" designed non-breakable mill duty resistors and Staxrite®, the multiple resistor mounting frame. Together these two units become a solid free-standing resistor bank that can be "custom-tailored" to meet your specific needs. Staxrite resistor frames, available in graduated sizes, will accommodate up to nine non-breakable resistor units. Add to this the optional feature of a terminal board and grid-to-terminal wiring and your resistor bank is ready for rapid installation. No more time-consuming box-to-box mounting. Costly on-the-job wiring is cut to a bare minimum. A Staxrite resistor bank saves valuable space too . . . it only requires the floor area of a single resistor box.

Notice how easily the "draw-out" designed resistor units slide in and out of position; this is a Cutler-Hammer exclusive. Each resistor unit is completely independent, and can be serviced or replaced by a spare unit without disturbing end frames, adjacent resistor units, or mounting members. "Draw-out" design will cut your "down-time" during maintenance and alterations. Enclosed resistor banks also available . . . added safety for your men and protection for the resistors. For further information, write Dept. N213, Cutler-Hammer Inc., Milwaukee 1, Wis.

Cutler-Hammer's Non-breakable Mill Duty Resistors are the choice of Mill engineers everywhere



These extra rugged resistors were designed specifically for mill and crane applications where service is severe. Cutler-Hammer 11011 Mill Duty resistors are available in three standard widths and can be mounted independently or in a Staxrite mounting frame. Check these other important features of design and construction.

- Stamped chrome-steel grids
- Shock-proof
- Vibration-proof
- Corrosion-resistant
- Welded grid joints
- No pressure dependent grid contacts
- Staggered, projected terminals
- Welded grid-to-terminal joints
- Heavy duty mica insulators

CUTLER-HAMMER CONTROL CH

CUTLER-HAMMER

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Associates: Canadian Cutler-Hammer, Ltd.; Cutler-Hammer Mexicana, S. A.; Intercontinental Electronics Corporation.